Jan. 15, 1952 E. J. DOEHLER 2,582,316

RAILROAD CAR HANDLING SYSTEM AND APPARATUS

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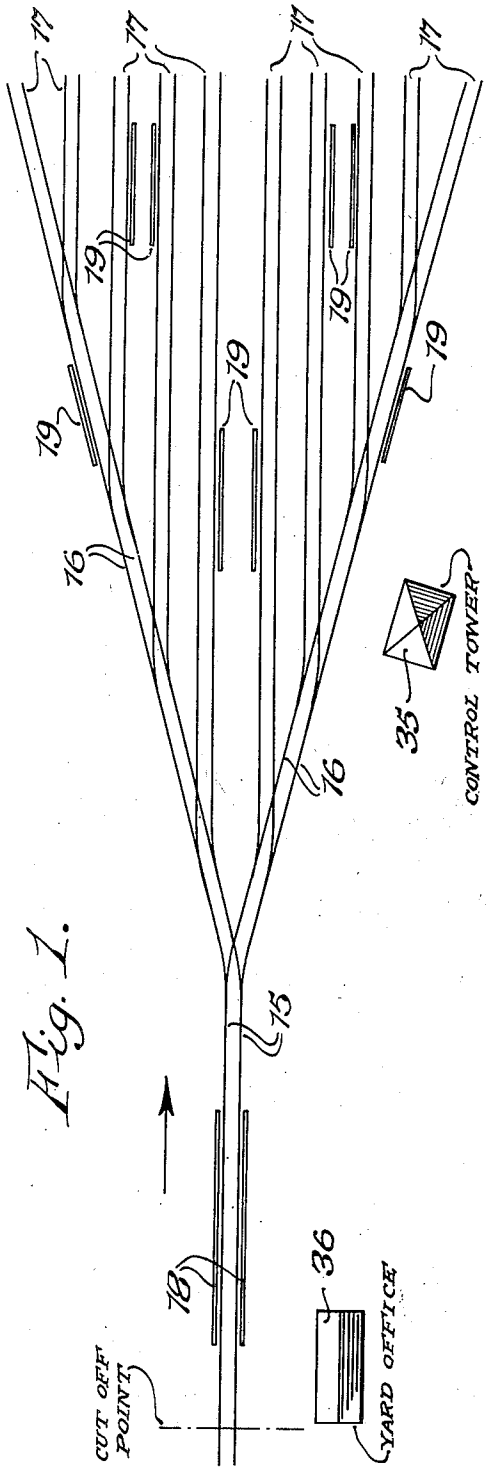


Fig. 1.

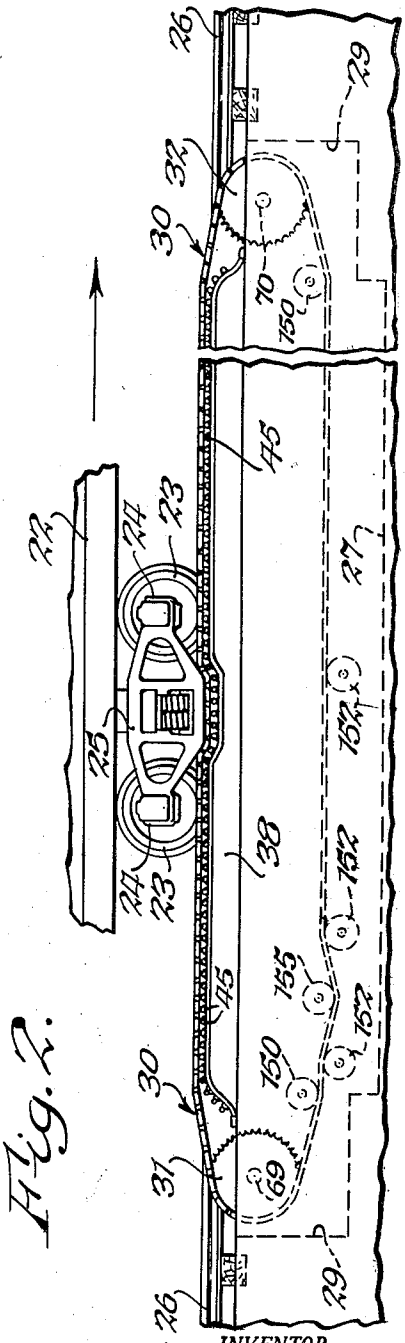


Fig. 2.

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RAILROAD CAR HANDLING SYSTEM AND APPARATUS

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Fig. 3.

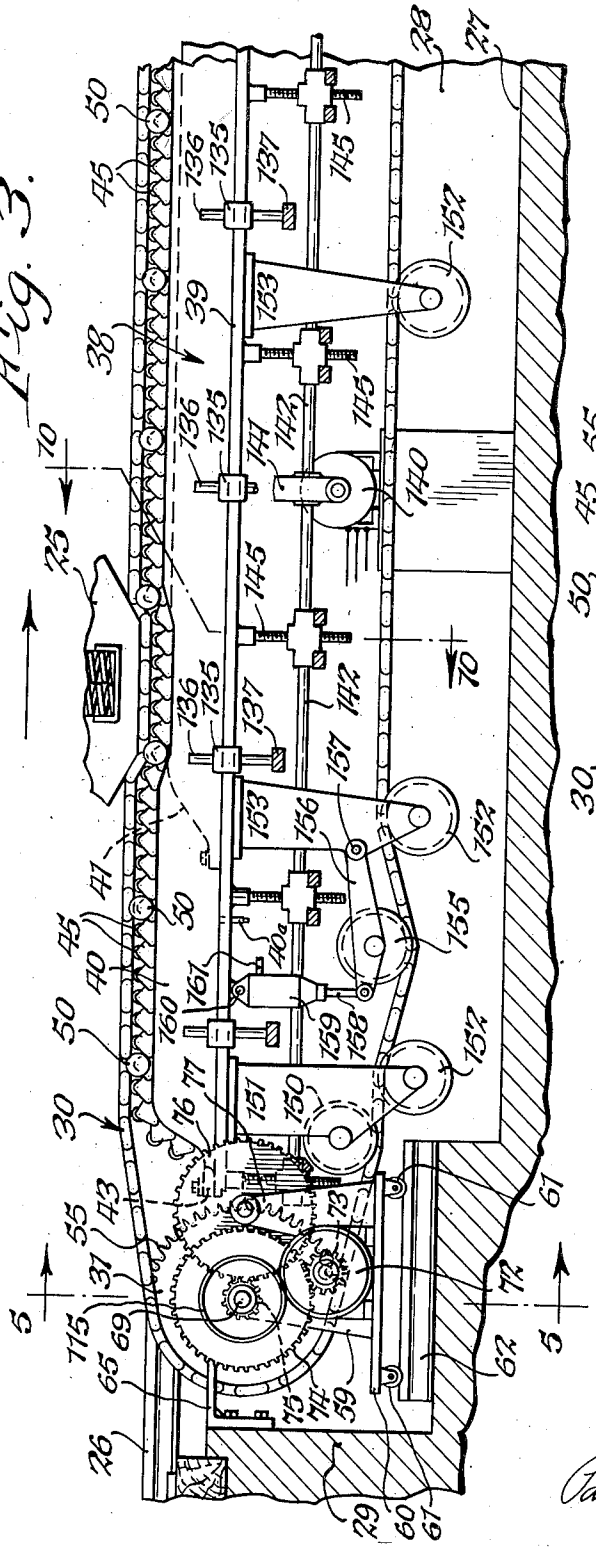
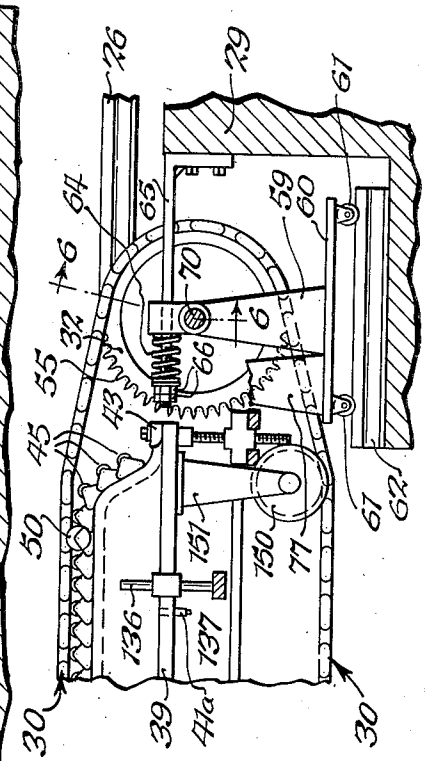


Fig. 4.



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RAILROAD CAR HANDLING SYSTEM AND APPARATUS

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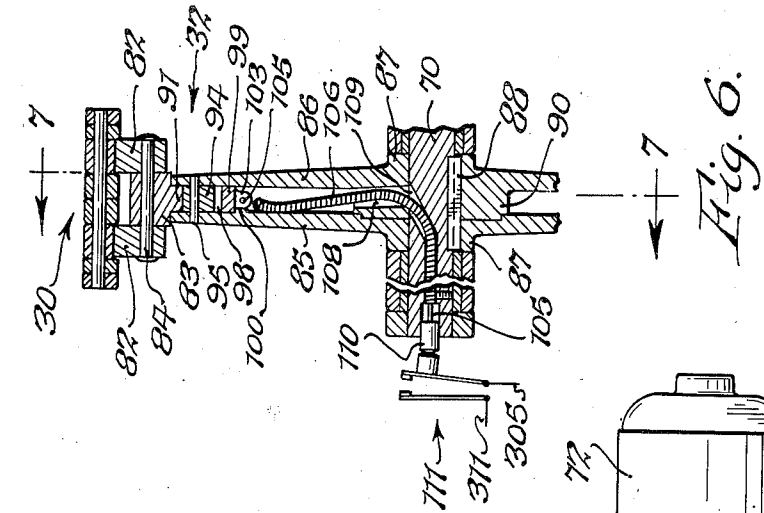


Fig. 6.

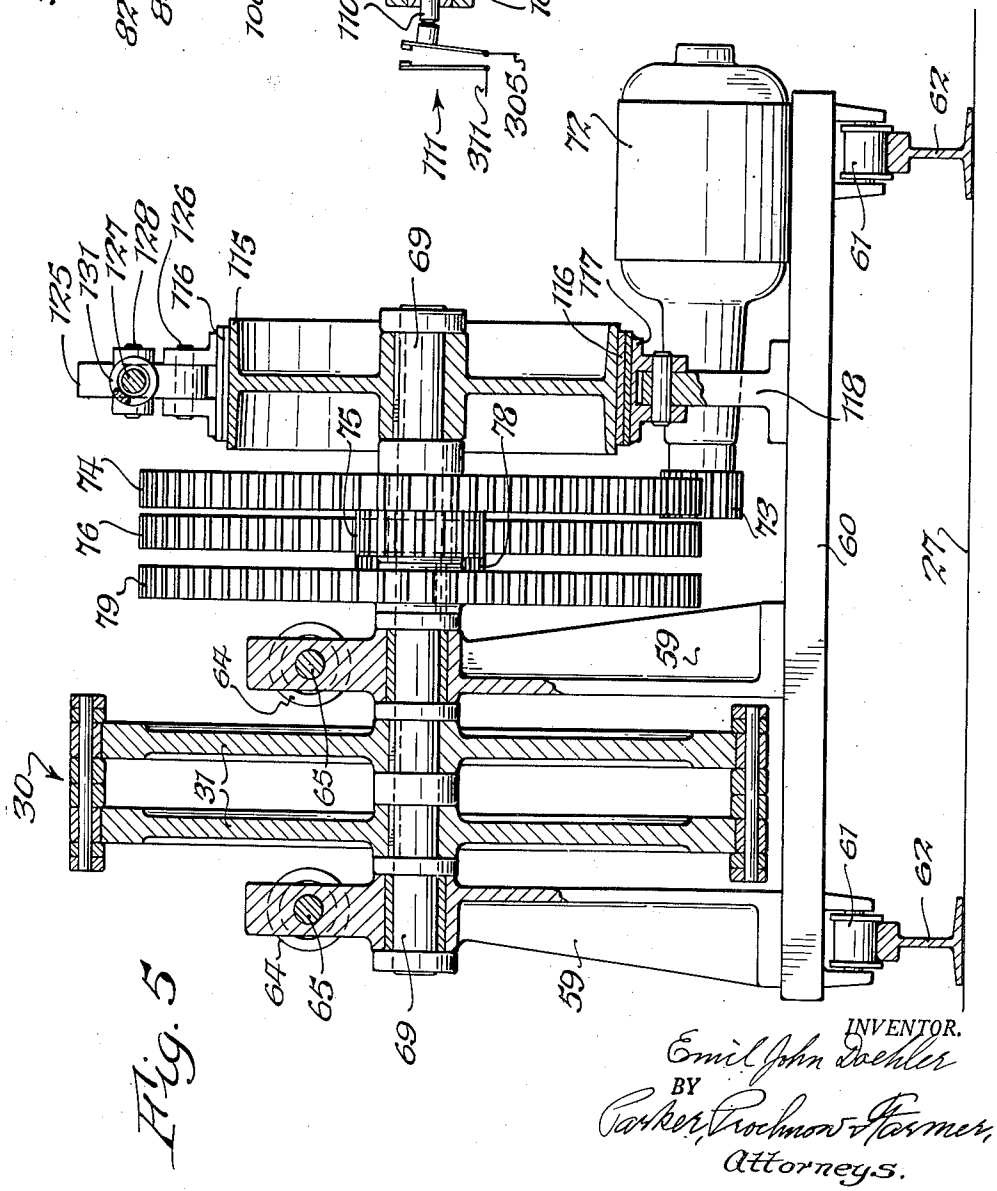


Fig. 5

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RAILROAD CAR HANDLING SYSTEM AND APPARATUS

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Fig. 8.

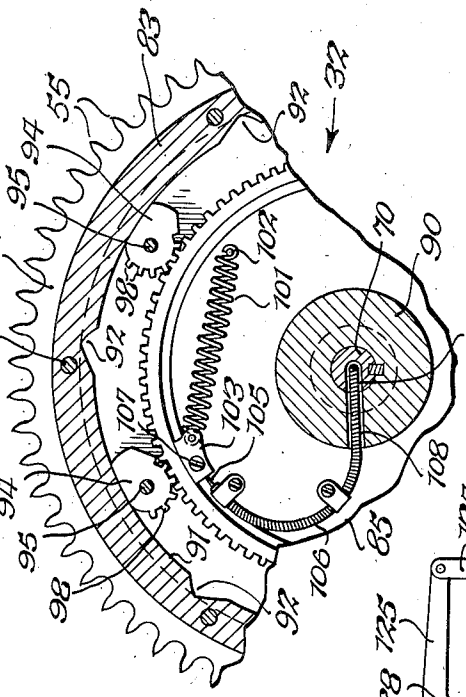


Fig. 9.

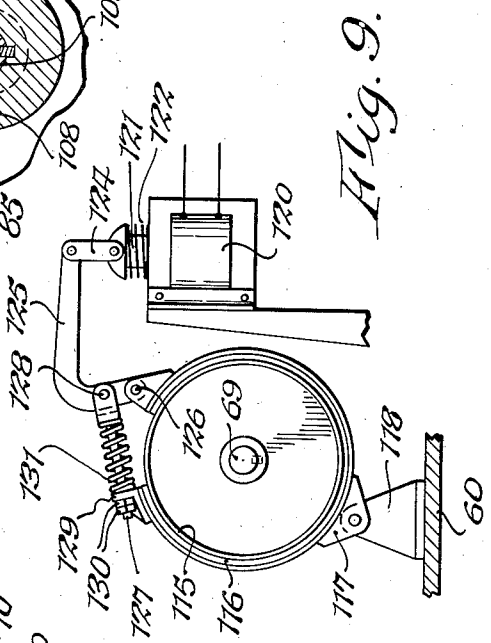
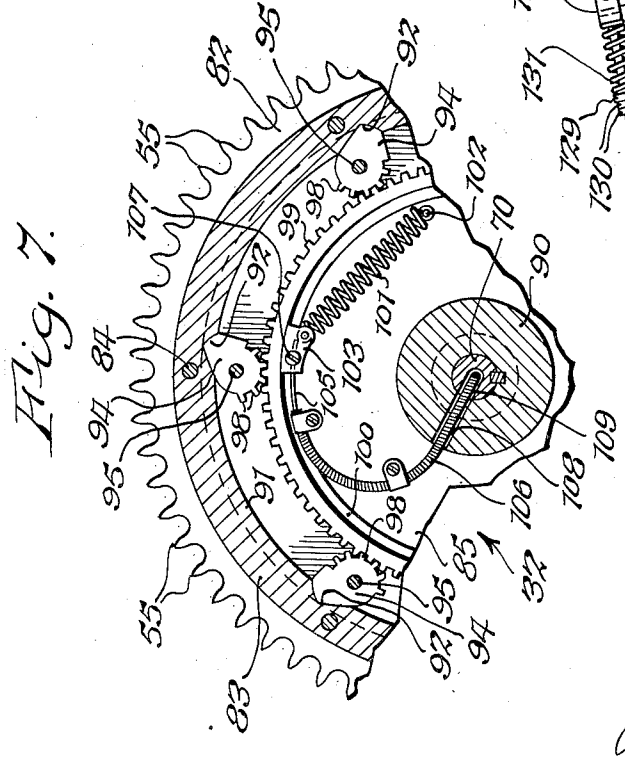


Fig. 7.



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RAILROAD CAR HANDLING SYSTEM AND APPARATUS

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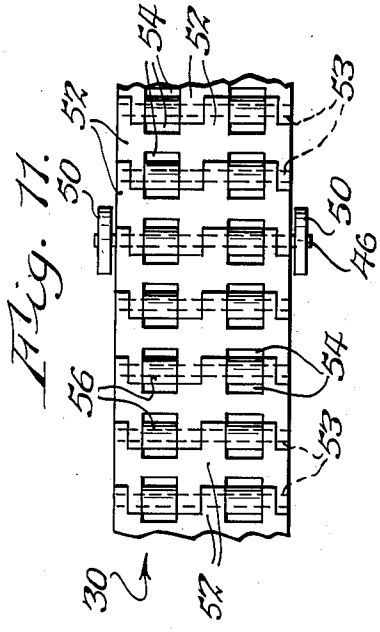


Fig. 11.

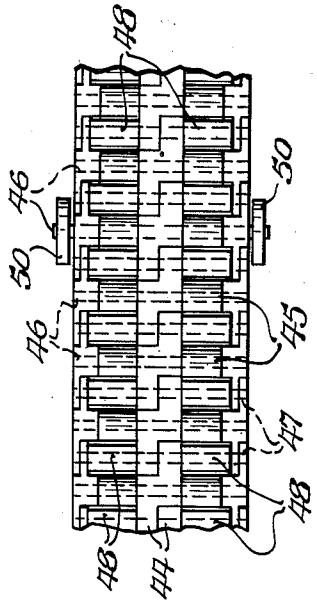


Fig. 12.

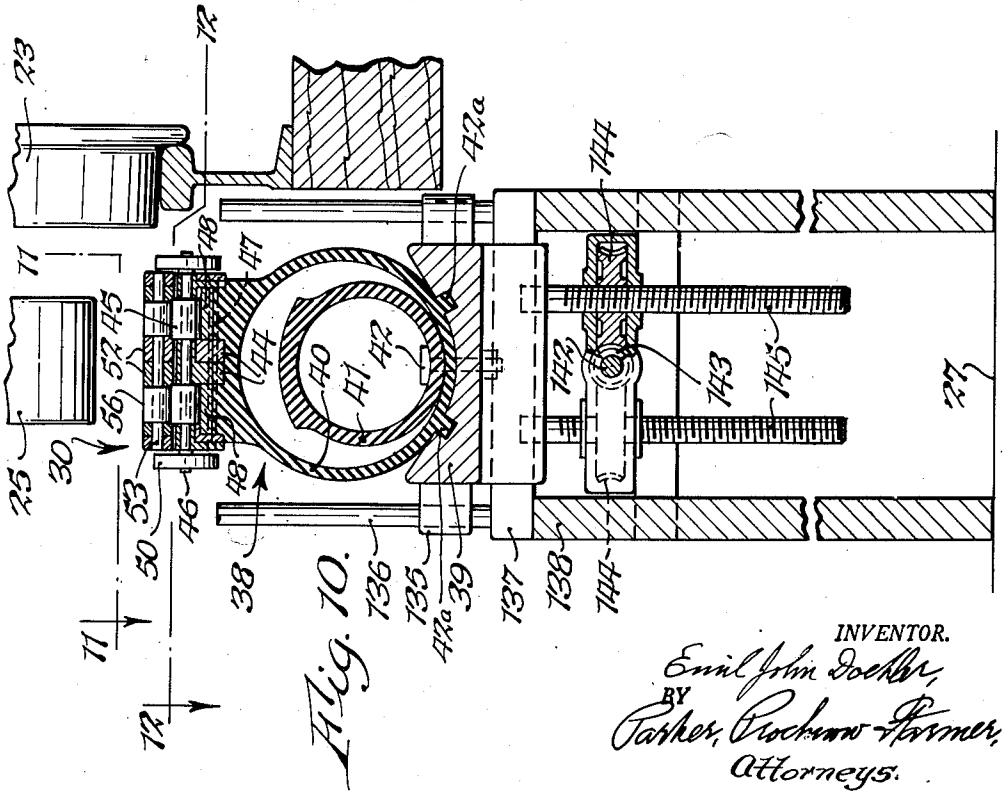


Fig. 10.

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RAILROAD CAR HANDLING SYSTEM AND APPARATUS

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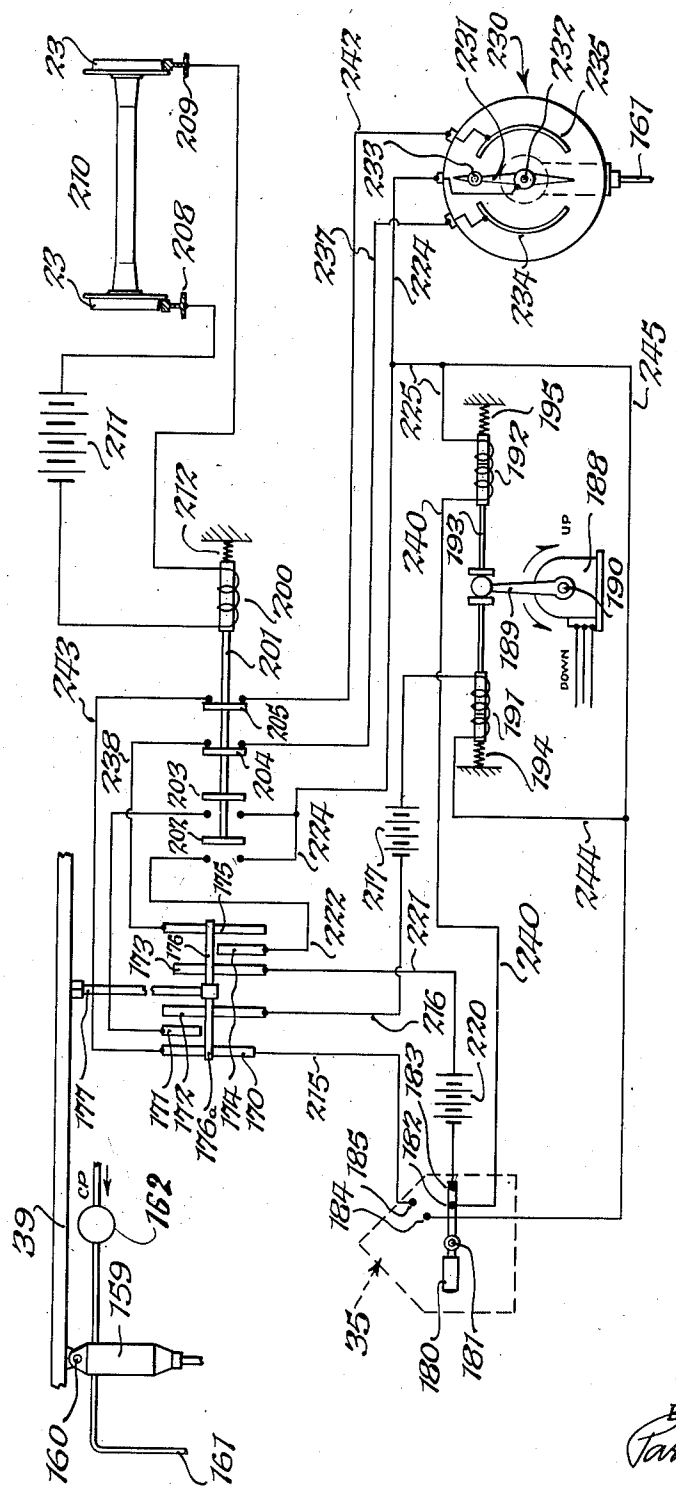


Fig. 13.

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RAILROAD CAR HANDLING SYSTEM AND APPARATUS

Filed Feb. 11, 1950 7 Sheets-Sheet 7

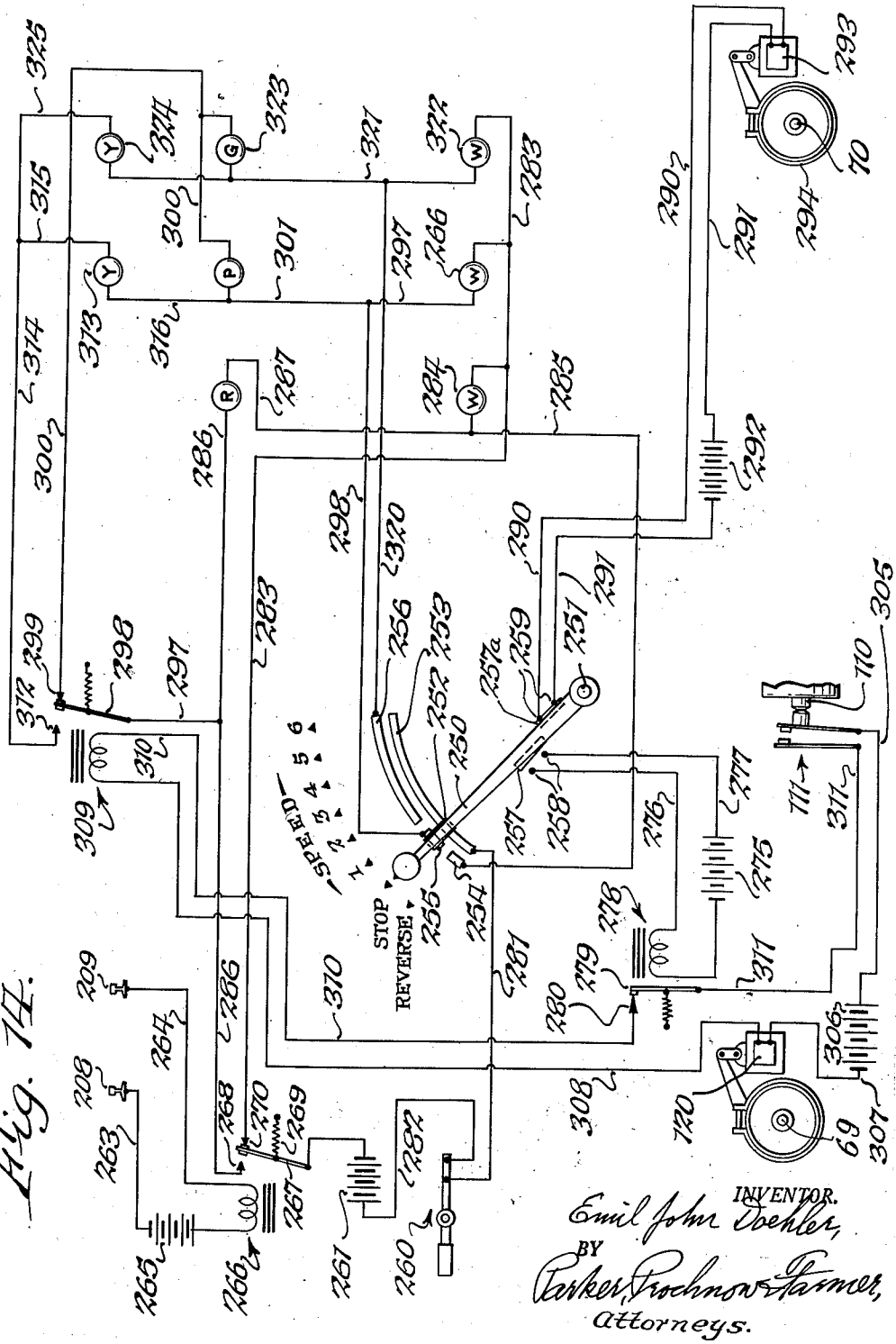


Fig. 17.

Patented Jan. 15, 1952

2,582,316

UNITED STATES PATENT OFFICE

2,582,316

RAILROAD CAR HANDLING SYSTEM AND APPARATUS

Emil John Doehler, Buffalo, N. Y.

Application February 11, 1950, Serial No. 143,811

32 Claims. (Cl. 104—26)

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This invention relates to improvements in railroad car handling systems and apparatus for use in connection with the movement of railroad cars to control their speed and direction of travel during the classification of the same in railroad yards.

In many railroad freight yards, freight cars as they are received from incoming trains are disconnected from the trains one at a time and reclassified as to further destination. These yards include a large number of branch tracks connected by a series of switches to a single or main track and the switches are controlled by operators according to the destination of each car. During such classification, the disconnected cars are set in motion on the main track at an estimated speed which is intended to be sufficient to carry them to the particular branch track on which they are to be coupled with other cars intended for the same destination. The imparting of movement to the cars on the main track to carry them to their intended tracks has heretofore been effected either by means of a locomotive, or by providing in the yard a "hump" upon which the cars are run by the locomotive, and then permitted to run free down the inclined portion of the "hump" to gather the necessary speed to carry them to the branch tracks. It is impossible for the operator of the locomotive to impart to all cars just sufficient speed to carry them to their desired locations, and consequently, some cars may come to a stop before reaching the desired location, and other cars will receive too much speed so that they strike other cars already on the branch track with sufficient force to damage the contents of the cars or the cars themselves. When "humps" are used to impart speed to the cars, the "humps" are initially constructed to impart sufficient speed and momentum to the cars to carry them to the remotest portions of the branch tracks under the average weather conditions. If the weather, wind, or condition of the tracks are adverse or unfavorable, the cars may come to a stop before reaching their intended designations. If weather or track conditions are favorable, and cars travel down the "hump" too rapidly, the cars will impact against other cars already located on the desired track, and these impacts frequently are sufficiently severe to cause serious damage to the contents of the cars, or to the cars themselves. Much of the damage to merchandise shipped by railroads results in these classification yards, resulting in serious expense and loss to the railroads.

One of the objects of this invention is to provide a railroad car handling system by means of which the objections of former systems can be overcome, and whereby the speed of movement of railroad cars can be controlled at different locations along the tracks so as to prevent damaging impacts of cars against others. Another object is to provide a system of this type with car handling apparatus by means of which the speed of the free running cars can be increased or decreased as desired. It is also an object to provide car handling devices by means of which the direction of movement of a car may be reversed.

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A further object is to provide car handling apparatus of this type which cooperates frictionally with undersurfaces of the trucks of the railroad cars. Another object is to provide car handling apparatus including endless chains which cooperate frictionally with the car trucks to accelerate or decelerate the movement of the cars. It is also an object of this invention to urge the chains into engagement with the trucks by a yielding pressure. A further object is to provide readily controllable means for varying the speed of travel of the chains so that the speed of the cars may be controlled thereby. A further object is to provide apparatus of this type with braking means for slowing the speed of free running cars if the same travel at a greater speed than the chain.

It is also an object of this invention to provide car handling apparatus of this type with means for raising or lowering the truck engaging portions of the apparatus to cooperate with truck frames whose bottom surfaces are of different heights above the ground. A further object is to provide means of this type whereby such portions of the apparatus will be raised or lowered automatically according to the height of the lower surfaces of the truck frames of a car. Another object is to provide resilient cushioning means on which the upper run of the truck engaging chain of the car handling device travels. A further object is to provide a structure of this kind in which the resilient cushioning means is supported on a cradle which may be raised or lowered to adapt the apparatus to cooperate with trucks whose bottom surfaces are at various heights above the tracks.

It is also an object of this invention to provide a pneumatic, resilient member for supporting the upper run of the sprocket chain. A further object is to provide a flexible supporting track for the upper run of the endless chain and which is mounted on a resilient member.

It is also an object of this invention to pro-

vide a car handling device including an endless chain having the upper run thereof passing over a resilient or flexible support which will yield to a greater extent when the chain is engaged by trucks with low bottom surfaces and to a less extent when engaged by trucks with relatively high bottom surfaces, thereby varying the slack in the lower run of the chain, and whereby such slack is utilized for automatically raising and lowering the resilient member.

Another object is to provide a car handling mechanism in which the endless chain engaging the trucks may overrun the drive shaft of one of its sprocket wheels when the car is travelling at a rate higher than the rate of travel than the chain, and whereby the overrunning of the rail serves to apply a brake to the chain.

Another object is to provide remote control means for the car handling devices whereby they can be readily operated from a control tower or other convenient position. A further object is to provide indicators in the control tower by means of which an operator can readily ascertain the condition and operation of the various car handling devices in the classification yard.

Other objects and advantages will appear from the following description of one embodiment of the invention and the novel features will be particularly pointed out hereinafter in connection with the appended claims.

In the accompanying drawings:

Fig. 1 is a plan view of a portion of a railroad classification yard having a railroad car handling system and apparatus embodying this invention applied thereto.

Fig. 2 is a side elevation of a railroad car handling apparatus on an enlarged scale.

Fig. 3 is a longitudinal sectional elevation on a still larger scale of one end of the apparatus.

Fig. 4 is a similar sectional elevation of the other end of the apparatus.

Fig. 5 is a transverse sectional elevation thereof, on line **5—5**, Fig. 3, on a still larger scale.

Fig. 6 is a fragmentary transverse sectional elevation thereof, on line **6—6**, Fig. 4.

Fig. 7 is a fragmentary sectional elevation thereof, on line **7—7**, Fig. 6, showing the portion of the control mechanism for driving the forward sprocket wheel which imparts forward motion to the cars and which puts into operation a brake device for retarding the forward movement of a car.

Fig. 8 is a similar sectional view showing the parts of the mechanism in different positions.

Fig. 9 is a fragmentary elevation showing a brake for use in retarding the movement of a car engaging chain of the apparatus.

Fig. 10 is a fragmentary transverse sectional elevation thereof, on line **10—10**, Fig. 3, showing the chain and yielding member lowered out of engagement with a car truck.

Fig. 11 is a top plan view of a portion of the apparatus showing the chain which engages a bottom surface of a truck frame, the view being taken on line **11—11**, Fig. 10.

Fig. 12 is a sectional plan view, taken on line **12—12**, Fig. 10, showing a part of the upper surface of a flexible supporting track for the upper run of the endless chain.

Figs. 13 and 14 are diagrammatic views showing the electrical connections between various parts of the mechanism.

Referring, in the first place, to Fig. 1, **15** shows by way of example a portion of a railroad classification yard, to which card handling devices

embodying this invention have been applied. The yard shown includes a main track **15** having a pair of main branch tracks **16** connected therewith and a plurality of other branch tracks **17** connected with the main branches **16** by means of switches (not shown) of any other suitable type. **18** represents in general a pair of car handling devices arranged at opposite sides of the main track **15** for engagement with parts of the railroad cars, and **19** represents similar devices arranged at the sides of branch tracks.

In Fig. 2, **22** represents a portion of a railroad car having wheels **23** secured to axles, the outer ends of which are journalled in journal boxes **24** formed in the ends of truck frames **25**. **26** represents one of the rails or tracks on which the wheels operate. The car handling devices are preferably arranged in pits located along one or both sides of the tracks, the pits containing suitable floors or bases **27** for supporting the mechanism, side walls **28** and end walls **29**.

The car handling apparatus illustrated by way of example in Fig. 2 is shown as cooperating with the lower surfaces of the car trucks **25** which act as shoes to bear on the upper run of an endless chain **30** of the apparatus. It will be understood, however, that if desired, the chains **30** may cooperate with other suitable parts of railroad cars, which either form portions of the railroad cars or attachments thereto, for cooperation with my improved car handling apparatus. If desired the lower faces of the car trucks may have parts or extensions (not shown) applied thereto for cooperation with the upper surface of the chain **30**. The endless chain of each car handling device or apparatus operates in connection with sprocket wheels or gears **31** and **32**, and the chain is arranged in such relation to the tracks and lengthwise thereof and parallel thereto so that the upper runs thereof may cooperate with the lower surfaces of the trucks **25** or other corresponding parts of the railroad cars. The word "truck" will hereinafter be used to designate not only the actual car trucks, but any downwardly extending shoes, skids or other parts mounted on the railroad cars for cooperation with my car handling apparatus. The car handling devices may be arranged at opposite sides of the track, as are the devices **18**, shown in Fig. 1, in which case, the endless chains of both devices are connected to operate at the same speeds and the chains will, consequently, act simultaneously on two opposite trucks of a car, or the car handling devices may be arranged at one side only of the tracks as are the devices **19** in Fig. 1. However, the construction and operation of the car handling devices **18** and **19** are identical, although they may, if desired, differ in length.

The endless chains **30** which cooperate frictionally with the lower surfaces of the trucks of the cars, are driven at predetermined or desired speeds by any suitable motors. Consequently, the chains of the car handling devices **18** may be driven at higher speeds than those of the devices **19**, so that sufficient speed and momentum is imparted to the cars by means of the car handling devices **18** to ensure that the cars actuated thereby will at least reach the next car handling devices on the branch tracks, or sufficient to cause the car to reach its destination on a branch track if such branch track is not provided with an additional car handling device. The rates of travel of the chains **30** are preferably controlled by an operator who may be located in a control tower **35**, Fig. 1, and he may receive instructions as

to the destination of a car from a yard office 36. The operator in the control tower, consequently, sets the switches in accordance with information received by him from the yard office, as was heretofore done in classification yards, and in addition, the operator in the control tower is provided with means for regulating the speeds of the various chains 30, so that cars after reaching the handling devices on any of the branch tracks will receive just enough speed and momentum to carry them to the desired location on such branch track. If my improvements are used in yards which are provided with "humps" or inclined portions of tracks along which the cars may run freely to receive their initial speed or momentum, the handling devices 18 may be omitted, or the cars may be pushed along the main track 18 by a locomotive or other means, without using the car handling devices 18.

As will be hereinafter described, the car handling devices or apparatus are also provided with brake means for reducing the speed of the cars. Consequently, the speed at which the cars move out of engagement with the chains 30 may be closely regulated by means of the operator so that the car leaves the last handling device 19 with just sufficient speed to contact another car on the branch track and to become coupled therewith, without such impact as would damage the contents of the cars or the cars themselves.

Yielding support for chain

The upper run of the chain 30 of each car handling apparatus is preferably yieldingly supported in the desired relation to the trucks 25 of the cars which are being handled, and for this purpose, an elongated flexible cushioning member, generally designated as 38, is provided. This cushioning member will compensate for variations in the heights of the lower surfaces of the car trucks 25 above the rails 26, and serves to yieldingly press the chain against the undersurfaces of the trucks. This cushioning member or pad is mounted on a rigid supporting bed or cradle 39 and may be of any suitable construction. As shown by way of example, the cushioning member includes a hollow, elongated tube or shoe 40 of rubber or rubber-like material which may be inflated with air or other gas in a manner similar to a pneumatic vehicle tire. The pressure maintained in the cushioning member should be such as to press the chain against the undersurfaces of the trucks with enough pressure so that sufficient friction is produced between the chain and the trucks, that the speed of the cars may be either increased or decreased to correspond with that of the speed of travel of the chain. If desired, an additional tube 41 may be provided within the tube 40 which may be inflated at a higher pressure than the tube 40 in case excessive loads are imposed on the outer tube 40. Air under pressure may be admitted into the tubes 40 and 41 respectively through air inlet tubes 40*a* and 41*a* respectively, as shown in Figs. 3 and 4. The inner tube 41 preferably terminates at a distance from the leading end of the outer tube 40, as shown in Fig. 4, so that as a truck moves on the chain 30 from left to right in Fig. 3, the truck initially encounters less resistance, after which the upward pressure of both tubes is applied to the truck. The tubes may be held in upright position intermediate of their ends in any suitable manner, for example, by means of bolts 42 shown in Fig. 10 which extend through the tubes 40 and 41 and the bed or

cradle 39, and if desired, the tubes may have projecting parts 42*a* which extend into recesses in the upper surface of the bed 39. The ends of the tube 40 preferably are inclined at their opposite ends, and the chain 30 also extends upwardly at an inclination from each sprocket wheel to the ends of the cushioning member, so that the pressure of the chain is exerted gradually on the trucks as they pass into engagement with the car handling apparatus.

The tube 40 may be secured to the supporting bed or cradle 30 in any suitable or desired manner, and the ends of the tube taper or incline downwardly and may be rigidly secured to the cradle by means of suitable clamping devices 43, Figs. 3 and 4. Other suitable securing means may be provided, if desired, lengthwise of the cradle 39 to hold the tubes against turning on the bed. The tubes may be formed in a plurality of shorter lengths arranged end to end, if desired. One of the purposes of the resilient cushioning member is to enable a car truck, as it moves lengthwise of the car handling apparatus, to make an indentation in the upper surface of the cushioning member, so that the slack in the lower run of the chain 30 will be varied, depending upon the depth of the indentation, the reason for which will be hereinafter explained.

The upper surface of the tube is constructed to support and guide the upper run of the endless track or chain 30, and consequently, guide means are provided which will reduce to the maximum extent the friction between the chain 30 and the tube 40, and which will be flexible to permit portions of the tube and chain to be depressed or indented by the car trucks. In the construction shown for this purpose, Figs. 3, 4, 10 and 12, a flexible track which supports anti-friction rollers is provided, which may, for example, include a plurality of links 44 each having one or more rollers 45 journalled thereon. The rollers are rotatable on pins or shafts 46, the ends of which may be secured in upwardly projecting parts of the links 44. The links are pivotally connected to each other by pins 47, and these pins also secure the links to the tube 40, for example, by providing on the tube a plurality of upwardly extending integral lugs or projections 48 having apertures therein through which the links extend. Other means may be provided for securing the flexible track to the tube 40. The links 44 are preferably relatively short in the direction of the lengthwise track so as to provide for the maximum flexibility of this track.

Suitable means are also provided for guiding the endless chain 30 for movement lengthwise of the flexible track mounted on the tube 40. In the construction shown for this purpose, guide wheels 50 are provided at intervals along the opposite sides of the flexible track. These guide wheels extend above the flexible track to a sufficient extent to engage the sides of the endless chain 30, and in the construction shown, these guide wheels are mounted on the ends of the pivot pins or shafts 46 which also support the anti-friction rollers 45.

The endless chain 30 may be of any suitable or desired construction, that shown including a plurality of links 52 connected by means of pins 53, see particularly Figs. 10 and 11. These links may be formed in any suitable or desired manner to cooperate with the sprocket wheels 31 and 32. The links are, consequently, provided at their transverse edges with recessed portions forming apertures 54 into which the teeth 55 of these

sprocket wheels may enter and in order to facilitate the engagement of the teeth of the sprocket wheel with the chain, rollers 56 are provided in the spaces 54 of the links and journalled on the pivot pins 53 which connect the links. A chain of any other suitable or desired construction may be provided, and if desired, the outer surfaces of the links of the chain may be provided with suitable pads or truck engaging parts (not shown). It will be noted that the sprocket chain is provided with the recesses or tooth engaging apertures 54 formed in pairs arranged side by side, and consequently, the sprocket wheels 31 and 32 are also provided with two sets of sprocket teeth arranged side by side. The sprocket wheel 31 is in the form of two separate wheels or parts arranged side by side, and suitably secured to prevent movement of one wheel part relatively to the other.

The endless chain may be placed under predetermined tension in any suitable or desired manner, and for this purpose, I have illustrated the sprocket wheels 31 and 32 as movably mounted, for example, on pedestals 59 which extend upwardly from carriages 60 which have wheels 61 mounted to operate on tracks 62, see Figs. 3, 4, and 5. Two pedestals 59 are provided on each carriage 60. The tracks are mounted on raised portions of the base 27 of the pit. Means are provided for normally urging the carriages 60 toward the opposite ends of the pit to apply the desired tension to the chain, and in the construction shown for this purpose, two pairs of springs 64 are provided, one end of each spring engaging a pedestal 59. The springs extend about rods 65 which are suitably secured to the upright end walls 29 of the pit. These rods also extend through apertures in the pedestals 59 and the outer ends of these rods are threaded to receive nuts 66 against which the other ends of the springs 64 bear and by means of which the tension on the springs 64 may be adjusted as desired. Consequently, by means of this construction, the chain 30 will normally be held at the desired tension, which is determined by the adjustment of the nuts 66 on the rods 65.

This resilient mounting of the sprocket wheels 31 and 32 serves the further purpose of preventing damage to or excessive strains on the sprocket chain, since whenever the chain is subjected to severe strains, the springs will yield to relieve the tension.

Driving means for chain

The endless chain 30 may be driven in any suitable or desired manner. In Figs. 3 and 4, I have shown a driving mechanism applied to the sprocket wheel 31 which is secured on a shaft 69, but it will be understood that a driving mechanism, which may be similar to the one for driving the sprocket wheel 31, may also be applied to the shaft 70 on which the sprocket wheel 32 is mounted. By way of illustration, only the driving mechanism applied to the sprocket wheel 31 is described. Under certain circumstances, as will be hereinafter pointed out, it is desirable to apply driving power only to the upper run of the endless chain 30, and not to the lower run. If the car handling device is to be employed only for moving cars to the right as indicated by the arrow above Fig. 3, then it will be necessary to have a driving mechanism only for the shaft 70 on which the sprocket wheel 32 is mounted. If the car handling device is intended to move cars in either direction, then for reasons hereinafter set forth, it will be necessary to provide independent driving mechanisms for both of the sprocket wheels 31 and 32.

In the particular construction illustrated by way of example, the power for driving the endless chain is provided by means of an electric motor 72, which is mounted on the carriage 60 and which is provided with a pinion 73 meshing with a gear 74 rotatably mounted on the sprocket gear shaft 69. The gear 74 has a small diameter pinion 75 rigidly secured thereto coaxially therewith, which meshes with an idler gear 76 mounted on a pedestal 77, Figs. 3 and 4. This idler gear 76 has a small pinion 78, Fig. 5, which meshes with a gear 79 rigidly secured on the shaft 69. By means of this construction, it will be obvious that the gear 79 will drive the sprocket wheel 31 to impart movement to the chain 30. The direction of rotation of the motor 72 is preferably selected so that the driving mechanism will apply tension to the upper run of the chain 30, which, in the case of the driving mechanism shown at the left end of Fig. 3, will drive the chain to the left in Fig. 3, in a direction opposite to the arrow above that figure. Similarly the driving mechanism applying power to the shaft 70 and sprocket gear 32 will apply tension to the upper run of the chain 30 in a direction to the right in Fig. 3 as indicated by the arrow.

The car handling device shown in the drawings is intended to operate on cars which normally approach the handling mechanism in the direction indicated by the arrow above Fig. 3. Consequently, power is applied to the sprocket wheel 31 only when a car is to be moved to the left in Fig. 3, and during the normal operation of the device only the shaft 70 will be operated in a clockwise direction in Fig. 4 by an electric motor, such as the motor 72, and suitable gearing, such, for example, as that shown in Fig. 5, and this gearing is not again duplicated in Fig. 4, in order to avoid complicating the drawings.

Car retarding and stopping mechanism

When a car moves into engagement with the car handling device at a speed greater than that at which the chain 30 is being driven, it is necessary to retard the movement of the car. Also, it may at times be desirable to use the car handling mechanism for the purpose of stopping a car and then reversing the movement thereof.

The retarding and stopping mechanism may be of any suitable or desired construction and that shown includes an overrunning clutch incorporated in the sprocket wheel or gear 32 and which actuates a brake mounted on the shaft 69, so that in retarding or stopping a car while moving in the direction indicated by the arrow in Fig. 3, tension will be applied to the upper run of the chain through the sprocket wheel 31 and the brake mechanism.

The sprocket wheel 32 is shown in detail in Figs. 6 to 8 inclusive, and includes a pair of annular sprocket gear members 82 having teeth identical with those of the two parts of the sprocket wheel 31. These two annular sprocket gears are suitably secured to an annular ratchet member 83, for example, by means of bolts or rivets 84.

The ratchet member 83 is mounted on the peripheral portions of a pair of disks 85, 86 having hub portions 87 secured to the shaft 70, for example, by means of a key 88. The outer or peripheral portions of the disks 85, 86 are spaced apart, as clearly shown in Fig. 6, and the hub portion of

disk 86 is provided with an extension or shoulder 90 which engages the hub portion of the disk 85 for the purpose of correctly spacing the two disks relatively to each other. The outer or peripheral portions of the disks receive between them an annular, inwardly extending projection 91 on the ratchet member 83. This ratchet member is not secured to the disks 85, 86, and consequently, the annular ratchet member 83 may revolve about the peripheries of the disks 85, 86.

When the shaft 70 is rotated in a clockwise direction in Figs. 7 and 8, this rotation is transmitted to the ratchet member 83, which, for this purpose, is provided on the inner surface of its inwardly extending projection 91 with notches or recesses 92, and the disks 85, 86 have dogs or latches 94 suitably pivoted thereon, for example, by means of pivot pins 95 extending through the two disks 85, 86 and the dogs or latches 94. The dogs are yieldingly urged to rotate about their pivot pins 95 so that the leading ends of these dogs will enter the notches 92, as shown in Fig. 7, in which case clockwise rotation of the shaft 70 will be transmitted through the disks 85, 86 and through the dogs 94 to the annular ratchet member 83 and, consequently, to the annular sprocket gears 82.

Any suitable or desired means may be provided for yieldingly urging the dogs into engagement with the annular ratchet member 83 as shown in Fig. 7. In the construction shown for this purpose, the dogs are provided with gear teeth 98 which mesh with an annular gear 99 which is rotatably supported in the space between the disks 85, 86, for example, by means of a shoulder 100 extending inwardly from the disk 85 and by means of which the annular gear 99 is held in correct relation to mesh with the teeth 95 of the dogs 94. The annular gear 99 is, consequently, rotatable relatively to the disks 85, 86. A spring 101 is provided, one end of which is secured at 102 to the disk 85 and the other end of which is connected to a bracket or projection 103 secured to the inner surface of the annular gear 99, thus urging the gear to turn in a clockwise direction with reference to the disks 85, 86. This in turn resiliently urges the dogs 94 to turn in a counterclockwise direction so that their leading ends will tend to enter the notches 92.

It will be evident from the foregoing description that if a car moves into engagement with the endless chain 30 at a speed in excess of the speed of movement of the upper run of the chain 30, the chain will turn the sprocket wheel 32 at a higher rate than it is driven by its driving motor and when this happens, the annular sprocket gears 82 and the ratchet member 83 will move ahead in a clockwise direction at a greater speed than the disks 85, 86, thus causing the dogs 94 to swing about their pivot pins 95 into the position shown in Fig. 8, in which they will be out of driving engagement with the sprocket gears 82. Any other suitable overrunning type of clutch may be employed for this purpose.

Means are also provided to apply braking force to retard the movement of the chain 30 whenever the sprocket gears 82 overrun the disks 85, 86. In the construction shown for this purpose in Figs. 6 to 8, a wire 105 is provided in a flexible tube 106. One end of the wire is secured to the bracket or projection 103, for example, by means of a set screw 107. The flexible tube 106 containing the wire 105 is suitably secured to one of the disks 85 or 86 and extends through an opening or hole 108 in the inwardly extending hub portion 90

and bore or passage 109 in the shaft 70, one end of which is in registration with the hole 108 in the hub portion of the disk 86. The passage 109 in the shaft 70 extends to the adjacent end of this shaft, and a plunger 110 is movable in this bore in shaft 70 and is connected with the wire 105. Consequently, when the annular gear 99 is moved in a counterclockwise direction in Figs. 7 and 8 relatively to the disks 85 and 86, by the movement of the dogs 94 out of their clutching positions, as shown in Fig. 8, the bracket or projection 103 on gear 99 pushes wire 105 into tube 106 and forces plunger 110 outwardly beyond the end of shaft 70 into position to close switch 111, Fig. 6, which is mounted beyond the end of this shaft.

In the operation of the overrunning clutch, when a car engages the endless chain 30 at a speed greater than the speed at which the chain is operating, the sprocket gear 82 and the cam member 83 secured thereto will turn in a clockwise direction at a higher rate of speed than the driven disks 85, 86, so that the leading ends of the dogs 94 will be moved out of the recesses or notches 92 in the cam member, thus causing the dogs to be turned about their pivots 95. This turning motion will be transmitted to the annular gear 99, causing the same to turn to a slight extent in a counterclockwise direction relative to the disks 85, 86, which in turn pushes the wire 105 into its tube 106. This causes the plunger 110 to move outwardly with reference to the shaft 70 into position to close the electric switch 111 for actuating a brake.

Any suitable or desired type of brake may be employed, and since the braking power is to be applied in such a manner as to apply tension to the upper run of the chain 30, the brake which is actuated by the overrunning clutch of the sprocket wheel 32, will operate on the sprocket wheel 31, and consequently, is mounted on the shaft 69 as shown in Fig. 5. 115 represents the brake drum rigidly secured on the shaft 69 and 116 represents a brake band extending about the brake drum. The brake band may be held against rotation with the brake drum in any suitable manner, for example, by means of a bracket 117 secured to the brake band and pivoted on a pedestal 118 which may be mounted on the carriage 60, Figs. 5 and 9. The two ends of the brake band may be drawn toward each other to contract the band on the brake drum in any suitable manner, and in the construction illustrated a solenoid 120 is shown having a core 121 which is yieldingly held in a brake releasing position in which it extends beyond one end of the solenoid. This may, for example, be accomplished by means of a coil spring 122 surrounding the core 121. The core may be connected by means of a link 124 to a brake lever 125, one end of which is pivoted at 126 to one end of the brake band. One end of a rod 127 is connected to the brake lever 125, for example, by means of a pivot 128. The other end of this rod extends through a bracket 129 secured to the other end of the brake band, the bracket being provided with an aperture through which the rod 127 extends and a pair of nuts 130 are provided on the end of the rod for adjustment of the brake band. It will be seen from the foregoing description that when the solenoid 120 is energized by current flowing through the same due to the closing of the switch 111, the lever 125 will be swung about its pivot 126 in a clockwise direction, thus contracting the brake band into frictional and braking engagement with the brake

drum. A spring 131 extending about the rod 127 normally restores the brake band to its brake releasing position when the supply of current to the solenoid is interrupted. Brake means of any other suitable construction may be provided, such as reverse power braking of the motor driving the sprocket wheel 31.

As a result of the construction described, it will be noted that when the clutch through which the sprocket wheel 32 is actuated is overrunning for the reason that the chain 30 is moved by a car truck at a higher rate of speed than through the driving mechanism turning the shaft 79, then the brake acting on the shaft 69 at the opposite end of the car handling apparatus will be applied, thus applying tension to the chain for the purpose of retarding the speed of the car engaging the chain or stopping the movement of the same. The brake is preferably so adjusted as to bring about the retarding of the car with the minimum of sliding friction between the endless chain 30 and the car truck frame 25, it being desired to retard the car by the braking means rather than by permitting the truck to slide relatively to the chain, thus avoiding wear on the truck frames and the chain.

The car handling apparatus or device, as shown in the drawings, is intended mainly to handle cars moving in the direction of the arrow in Fig. 3, although if desired, the mechanism may be employed for stopping the car and reversing the movement of the same by operation of the sprocket wheel 31 and the driving mechanism therefor, shown at the left of Fig. 3.

In the use of the mechanism thus far described, the speed of rotation of the driving motor 72 for the sprocket wheel 32 is first adjusted to operate the chain 30 in the direction of the arrow in Fig. 3 at the speed which it is desired to have the car leave the car handling device. Consequently, if the car approaches the car handling device from the left in Fig. 3, at a speed slower than that desired, the chain 30 engaging the lower face of the car truck will impart to the car due to friction between the endless chain 30 and the car truck a speed for which the electric motor 72 has been set. If the car approaches the car handling device at a speed in excess of that desired, the braking mechanism which has been described will reduce the speed of the car so that the same will leave the end of the handling device shown in Fig. 4 at the desired speed. If it is desired to stop a car and reverse the direction of movement of the same, as may for example happen if a car is inadvertently diverted to the wrong branch track 17, the electric motor 72 operating the sprocket wheel 32 may be stopped, whereupon overrunning of the clutch will take place, thus applying the brake. When a car has been stopped, the motor rotating the sprocket wheel 31 may be operated to move the car in the reverse direction, i. e., to the left in Fig. 3.

Vertical adjustment of endless chain

Railroad car trucks are not of standard or uniform design and the lower surfaces of various types of car trucks 25 are, consequently, located at various distances above the rails 26. The problem of having the endless chain cooperate with car trucks whose lower surfaces are at different heights may be solved by making the flexible cushioning member 38 of sufficient size and flexibility so that the same will adapt itself to all of the various types of trucks which may be encountered. However, if desired, the upper run of the chain and the cushioning member 38 may be raised or lowered to an extent depending upon the height of the lower surface of the truck frame of the car which is about to be handled. Any suitable or desired mechanism for varying the height of the resilient cushioning device 38 and of the upper run of the chain 30 may be provided, and in the construction shown, this is accomplished by adjusting the height of the bed or cradle 39 on which the cushioning member 38 is mounted. This mechanism is illustrated in Figs. 3, 4 and 10 in which the bed or cradle 39 is provided with bearing lugs or projections 135, which are slidable on upright guide posts 136, which project upwardly from transverse bars 137 which may be suitably mounted in the pit in which the car handling mechanism is arranged. For example, as shown in Fig. 10, the transverse bars 137 may be mounted on suitable upright supporting members 138 which extend upwardly from the floor 27 of the pit, these upright members being omitted from Fig. 3 for the sake of clarity.

The raising and lowering of the bed or cradle 39 may be effected in any suitable or desired manner. In the particular construction shown, this may be effected by means of an electric motor 140, connected by means of suitable gearing arranged in a gear housing 141 to a drive shaft 142. This drive shaft is provided at intervals with worms 143 which drive worm gears 144. The axial or hub portions of these worm gears are internally threaded to cooperate with screw threads provided on upright posts 145, the upper ends of which are suitably secured to and held against turning relatively to the bed or cradle 39. Consequently, when the motor 140 rotates in one direction, the worms on the shaft 142 will turn the worm gears 144 in a direction to raise the bed or cradle 39, and when the motor 140 is rotated in the opposite direction, the bed or cradle will be lowered. The guide rods 136 serve to hold the cradle in correct relation to the car trucks at all adjustments of the cradle. Any other suitable means for raising or lowering the bed or cradle may be provided, if desired.

Since merely raising or lowering the upper run of the chain 30 without correspondingly raising and lowering the sprocket wheels 31 and 32 would vary the tension of the chain, means are provided which are connected with the bed or cradle to correspondingly raise or lower the lower run of the chain. In the construction shown for this purpose, a pair of idler wheels 150 are provided which are journalled on brackets 151 and which engage the upper surface of the lower run of the chain 30 adjacent to the sprocket wheels 31 and 32. These idler wheels 150 are so arranged that the angles from the horizontal at which the lower run of the sprocket chain extends from the sprocket wheels to the idler wheels 150 will be approximately the equivalent of the angle from the horizontal at which the upper run of the chain extends from the sprocket wheels to the flexible track mounted on the resilient member 38, when the cradle 39 is in a position approximately intermediate between its upper and lower limits of travel. With this arrangement of the idler wheels 150, it will be obvious that if the cradle 39 is raised, these angles will be changed, but there will be very little, if any, change in the slack of the lower run of the chain 39. Additional idler wheels 152 are preferably provided which engage the lower surface of the lower run

of the sprocket chain and these lower idler wheels 152 may be similarly mounted on the cradle 39, by means of one of the brackets 151 and additional brackets 153. Other means for supporting the lower run of the chain 30 may be provided. Consequently, when the bed or cradle 39 is raised or lowered, corresponding movement is imparted to both runs of the chain 30, so that the tension on the chain and the slack in the lower run of the chain will not be materially altered by such raising or lowering of the bed or cradle 39.

Automatic height adjustment of chain

The motor 140 for effecting the raising and lowering of the cradle may be operated manually, for example, by persons in charge of the control tower 35, who can judge the height of the lower surface of each car truck and who may accordingly adjust the height of the upper run of the chain 30 on the particular car handling device which is to cooperate with such car trucks. It is more desirable, however, to provide means for automatically adjusting the height of the bed or cradle 39 according to the cars to be handled, and this may be accomplished by suitable means controlled by the amount of slack in the lower run of the belt 30, which in turn depends upon the extent to which a car truck depresses the portion of the upper run of the chain engaged therewith into the yielding member 38. In the construction shown by way of example, an idler wheel 155 is provided which operates on the upper surface of the lower run of the sprocket chain 30. This wheel is mounted on an arm or lever 156 pivoted at one end thereof at 157 on one of the depending brackets 153, and the other end of this lever is connected to a piston rod 158 which cooperates with a piston arranged in a cylinder 159 suitably pivoted at 160 on the bed or cradle 39. A bellows may, of course, be used in place of the piston and cylinder, if desired. The cylinder may contain any suitable fluid under a predetermined pressure, which serves to depress the portion of the lower run of the chain 30 engaged by the roller 155 between two of the lower idler wheels 152, as clearly shown in Fig. 3. Such fluid pressure may be admitted to the cylinder through pipe or passage leading from a pressure regulating valve 162, Fig. 13. It will also be evident that when a car truck depresses the upper run of the chain 30, as shown in Fig. 3, due to cooperation of the upper run of the chain with the resilient flexible chain supporting member 38, there will be a corresponding shortening of the lower run of the chain, and this will consequently, cause the lower run of the chain to lift the wheel 155, and consequently, force the piston rod and the piston connected therewith upwardly in the cylinder 159. This increase in pressure is transmitted through a pipe or conduit 161 to suitable control devices for operating the mechanism for raising and lowering the bed or cradle 39. Consequently, in the use of this device, the bed or cradle 39 would normally be set into an approximately average position intermediate its upper and lower positions. If a car truck with its lower face higher than the average engages the chain 30, less than normal pressure will be developed by the piston in the cylinder 159 and automatic mechanism is, consequently, actuated to raise the bed or cradle 39 until the pressure in the cylinder 159 reaches the average or normal pressure. Similarly if the car truck 25 makes an excessively deep depression in the upper run of the chain 30 due to the fact that the lower surface of the car truck is lower than the average for which the apparatus is set, the piston in the cylinder 159 will be raised due to decreased slack in the lower run of the chain 30, so that a relatively high pressure will be developed in the cylinder 159. This will actuate mechanism for lowering the cradle 39.

The mechanism for automatically raising and lowering the bed or cradle 39 in accordance with pressures developed in the cylinder 159 may be of any suitable or desired nature, and that shown in Fig. 13, by way of example, is constructed as follows:

This mechanism includes a cradle height responsive contact device comprising a plurality of stationary electrical contact strips or bars 170, 171, 172, which cooperate with a movable contact member 176a and similar stationary bars 173, 174 and 175 which cooperate with a movable contact member 176. Both of these movable contact members may be connected in any suitable manner with the bed or cradle 39, for example, they may both be mounted on a rod 177, the upper end of which is secured to the cradle, so that the movable contact members will move in proportion to the movement of the bed or cradle.

180 represents a manually controlled switch lever pivoted at 181 and located in a position convenient for manual operation, for example, in the control tower 35. This switch lever in the position shown in Fig. 13 completes a circuit between two contacts or terminals 182 and 183 and when the handle portion of the switch lever 180 is depressed, so as to swing the same about its pivot, the switch lever engages two electrical contacts or terminals 184 and 185.

188 represents a motor controller for the cradle raising and lowering motor 140. This controller has an arm 189 pivoted thereon which may be swung about its pivot 190. This motor controller may be suitably connected with the motor 140 in any suitable or usual manner, for example, by means of three wires leading from the controller to the motor 140, and connected with a source of power (not shown) to cause the motor to operate in either direction of rotation. When the lever or arm 189 of the controller is moved to the left, it completes circuits within the controller to cause the motor 140 to move the bed or cradle downwardly and when the arm or lever 189 is swung to the right, it completes circuits to cause the motor to move the bed or cradle upwardly. When the arm 189 is in the upright position shown in Fig. 13, the circuits leading to the motor are broken.

The arm or lever 189 of the controller 188 may be automatically swung about its pivot by means of a pair of solenoids 191, 192, the cores of which are connected to a rod 193 formed to engage the arm or lever 189. Springs 194, 195 act on the cores of the solenoids 191, 192 respectively to normally hold the arm 189 in its upright or open circuit position, as shown in Fig. 13.

The raising and lowering of the bed or cradle 39 may be effected manually under certain conditions by means of the switch lever 180, and under other conditions the raising and lowering is effected automatically. For this purpose a circuit controller is provided which, in the construction illustrated, is actuated by means of a solenoid 200 which acts on a movable controller member or rod 201 having four movable contacts 202, 203, 204, 205 which are positioned to close circuits by engagement with stationary contacts of the controller. The solenoid 200 is actuated by the

car itself as it approaches the handling device or apparatus and, for this purpose, rails or tracks 208, 209 are provided adjacent the car handling device which are suitably insulated from each other and from other rails adjacent thereto. When the wheels of a car contact these rails, a circuit will be closed between the two rails through the car wheels and the car axle 210, which circuit includes a source of power 211 and the solenoid 200. Consequently, when a car contacts the rails 208, 209, a circuit is closed through the solenoid which draws the movable controller member 201 to the right in Fig. 13 against the action of a spring 212, and thus draws the movable contact members 204, 205 into circuit closing position and at the same time draws the movable contact members 202, 203 out of circuit closing position. Consequently, when a car is in contact with the rails 208, 209, the movable controller member 201 is moved to the right against the action of the spring 212 and draws the movable contact members 204 and 205 into circuit closing positions so that the raising and lowering of the bed or cradle 39 may be effected automatically. When the car wheels move out of contact with the rails 208 and 209, the movement of the cradle 39 may be effected manually into its lower or inoperative position in which it will be out of the way of a locomotive or cars which may pass by the handling device, and from its lowest or inoperative position to its average or normal position.

When the cradle 39 is to be lowered into its inoperative position in which it will not interfere with the passage of a locomotive or car along the same, the operator swings the handle portion of the lever 180 downwardly about the pivot 181 so that the contacts 184 and 185 are connected. This completes a circuit including a conductor 215 leading to the stationary contact bar or member 170 from which the current passes through the movable contact member 176a to the stationary contact bar 172, and then through conductor 216 to one terminal of a battery or other source of current supply 217, the other terminal of which is connected with the solenoid 191, thus causing the core of the solenoid to move to the left against the action of the spring 194 and moving the arm 189 of the controller 190 to the left into position to close a circuit to the motor 140 to cause the same to rotate in a direction to lower the cradle 39. The downward movement of the cradle will cause a corresponding downward movement of the contact member 176a until the same moves beyond the lower end of the stationary contact bar 170, which results in breaking the circuit through the solenoid 191. The spring 194 then returns the arm 189 into its upright or open circuit position, thus stopping farther downward movement of the cradle 39.

When it is desired to again restore the mechanism for automatic operation of the raising and lowering of the cradle 39, the handle of the switch lever 180 is raised into the position shown in Fig. 13, in which position, this switch lever remains for automatic operation of the mechanism for raising and lowering the cradle 39. When this lever 180 is swung into this position, the cradle is first moved into an intermediate position approximately midway between the upper and lower limits of its travel. This position is preferably selected so that the car handling device will cooperate with the majority of cars either by remaining in this position or by relatively slight movements up or down. When in an intermediate position, the minimum of time will be required to adjust the cradle up or down to the correct position to cooperate with the trucks of the car to be handled. Consequently, when the switch lever 180 is swung into the position shown in Fig. 13, assuming that the cradle is still in its lowest position, current is conducted by a circuit including the terminals 182 and 183, a battery or other source of power 220, and a conductor 221 leading to the stationary contact member 173 of the controller. The movable contact member 176, consequently, conducts current from stationary contact member 173 to the stationary contact member 174 and a conductor 222. Since at that time the rails 208 and 209 may not be connected by the wheels and axle of the car, the movable controller member 201 will be at the left of its path of movement, due to the action of spring 212, and consequently, the end of conductor 222 will be connected by the movable contact member 202 with a conductor 224 connected with a branch conductor 225 leading to one terminal of the solenoid 192, the other terminal of which is connected with conductor 240 leading to the switch terminal 182. This results in moving a core of the two solenoids to the right against the action of spring 195 and moving the arm 189 of the controller 188 to the right to connect the motor 140 in a circuit to raise the cradle 39. When the movable contact member 176 moves out of engagement with the stationary contact member 174, due to the upward movement of the cradle 39, this circuit to the solenoid 192 will be broken so that the cradle 39 will remain in its intermediate position.

As hereinbefore stated, the automatic raising and lowering of the cradle is actuated by means of a piston in the cylinder 159, shown in Figs. 3 and 13, which piston is moved into and out of the cylinder respectively by the increase and decrease in the slack in the lower run of the chain 38. The cylinder 159 is connected by a suitable conduit 161 to a pressure responsive instrument 230 which may be, in effect, a pressure gage of any ordinary or suitable construction having a pointer 231 movable about its pivot 232 in response to variations in pressure in conduit 161. The pointer is provided with a suitable contact brush 233 and is connected electrically with the conductor 224. The pressure responsive instrument 230 is provided at one side thereof with an arc-shaped contact bar or strip 234 and at the other side thereof with a corresponding strip 235. These two strips are spaced apart. When the pointer indicates low pressure, it swings in a counterclockwise direction so that its contact brush 233 engages the arc-shaped contact member 234. When the instrument is subjected to higher pressure, the pointer swings in a clockwise direction so that its brush 233 engages contact strip 235. The pointer is in any position intermediate of the two stationary contact strips 234 and 235 when the pressure in the conduit 161 is approximately normal.

When a car moves into engagement with the handling device, it engages the tracks 208 and 209 preferably simultaneously with the engagement of the leading car truck with the portion of the chain supported on the yielding member 38, and if the lever 180 is in the position shown in the drawing, the mechanism will be in position for automatic operation. If the car which is approaching the handling device has the lower surface of its truck at a height greater than normal or average, the depression of the upper run

of the chain into the cushioning member 38 will be less than normal. This results in more than normal slack in the lower run of the chain, thus producing a relatively low fluid pressure in the cylinder 159. A relatively low fluid pressure is maintained in the cylinder 159 to take the slack out of the lower run of the chain and, consequently, the pointer will normally be positioned near the lower end of the contact strip 234. Consequently, when such car with a high lower truck surface engages the chain, the pressure in the cylinder 159 will not be increased materially, so that the portion of the pointer 231 carrying the contact brush 233 will remain in contact with the stationary contact strip 234, which results in closing a circuit including conductors 224 and 237, which latter is in contact with contact 204 of the controller member 201. This contact 204 connects the conductor 237 with conductor 238 which leads to the stationary contact bar or strip 175. The movable contact member 176 will, consequently, conduct current from bar 175 to the stationary bar 173 which is connected by means of conductor 221 to the power source 220, switch lever 180 and conductor 240 leading to the solenoid 192, which actuates the controller 190 to cause the motor 140 to move the cradle 39 upwardly. This circuit is completed by means of conductors 225 and 224 back to the pointer 233. The cradle continues to move upwardly until the upper run of the chain 30 bears against the undersurface of the car truck 25, Fig. 3, with the desired pressure, making the required depression in the endless chain and the cushioning member 38. This causes a reduction in the slack of the lower run of the endless chain which, in turn, will move the chain engaging wheel 155 and piston rod 158 upwardly, thus increasing the pressure in cylinder 159. This increased pressure is carried by the conduit 161 to the pressure responsive device 230 and causes the pointer 231 to swing in a clockwise direction so that its brush 233 moves out of engagement with the arc-shaped contact strip 234, whereupon the circuit through solenoid 192 is broken, thus causing springs 194 and 195 to return the handle or lever 189 into a position in which the controller 188 shuts off the supply of current to the motor 140.

Similarly, if the car cooperating with the car handling device has the lower surface of the car truck lower than average, so that the car truck takes up more slack in the lower run of the endless chain 30 than normal, then the pressure in cylinder 159 will be increased, and consequently, the pointer 231 will turn in a clockwise direction so that contact brush 233 mounted thereon moves into engagement with the arc-shaped contact strip 235. This completes a circuit including the pointer 231, contact strip 235, a conductor 242, which is connected by the movable contact member 205, to conductor 243 connected with the stationary contact bar 170. Current will be conducted from this stationary contact bar by means of the movable contact member 176a to the stationary contact bar 172, which is connected by means of conductor 216 through power source 217 to the solenoid 191, thus actuating the controller 188 to move the cradle 39 downwardly. This circuit is completed by means of conductors 244, 245, 225 and 224, back to the pointer. When the cradle has been lowered to a point at which the slack in the lower run of chain 30 is normal, the pointer 231 will move in a counterclockwise direction out of engagement with the contact strip 235, and thus break the circuit to the motor 140.

When a car moves out of operative relation to the handling device, the circuit, including the tracks or rails 208 and 209 will be broken, so that the solenoid 200 is deenergized, thus moving the movable contact members 204 and 205 into circuit opening positions and moving the movable contact members 202 and 203 into circuit closing positions, whereupon the cradle will be returned to its average or intermediate position. If, when the car moves out of operative relation to a car handling device and the cradle is above its normal position, circuits will be completed which will cause the cradle to be lowered until movable contact member 176a moves out of engagement with the stationary contact bar 171, whereupon the motor 140 will be stopped. If, when a car moves out of operative relation to the car handling device with the cradle in a lower than normal position, circuits will be completed as hereinbefore described, to move the cradle upwardly until the movable contact member 176 moves out of engagement with the stationary contact bar 174. Since the motor 140 actuates the cradle through worms driving worm gears, it is assumed that whenever the motor is stopped, any weight bearing downwardly on the cradle 39 will not tend to turn the motor shaft. However, if other gearing is employed, the motor may be equipped with any usual or customary braking means (not shown) which would prevent turning of the motor except when current is supplied to the same.

If the car moving into engagement with the car handling device has the lower face of its trucks of average height, the slack in the lower run of the chain will be such that the movable pointer 231 of the pressure responsive device 230 will pass into the space between the stationary contact strips 234 and 235, so that no raising or lowering of the cradle will result.

Car speed and direction control means

The speed at which the endless chain 30 is driven, as well as the stopping of this chain and the reversing of the same is preferably controlled in the control tower 35 by any usual or suitable motor control device, one such control being provided for each car handling device. One example of such a control device is shown in Fig. 14, in which 250 represents the handle of a controller which is suitably secured to a shaft 251, which actuates suitable rheostats, motor control devices, or the like for controlling the two motors 72 which drive the sprocket wheel shafts 69 and 70. Since motor control devices of this type are common and well known, they are not herein illustrated.

In order to guide the operator in the control tower 35 as to condition of each car handling device, a series or set of signals, such for example as lights, may be provided for each car handling device, one such series or set of lights and the connections leading to the same are illustrated in Fig. 14. In order to actuate these signals or lights, the controller handle 250 is provided with a circuit closing or contact member 252 secured thereon in position to engage an arc-shaped stationary contact strip 253 and to connect the same to any one of three stationary contact members 254, 255 and 256 when the controller lever 250 is respectively in reverse, stop and forward positions.

The controller handle 250 is also provided with two contact members 257 and 257a. When the

controller handle is in reverse position, the contact member 257 forms an electrical connection between two terminals 258, and when the controller handle is in stop position the contact member 257*a* connects two terminals 259. Preferably the controller is provided with suitable connections for operating the motor controlling the shaft 70 at a number of different speeds, for example speeds 1 to 6 as indicated in Fig. 14, which may represent approximately various speeds from 1 to 6 miles per hour travel of the upper run of the chain 30.

A plurality of lights are shown in Fig. 14. The three lights marked "W" being white lights which may become illuminated whenever no car is in position to be operated upon by the car handling device. The light marked "R" is red and is used to indicate reverse movement of the chain 30 of the car handling device. "P" represents a purple light which indicates that the car is stopped or standing on the car handling device and "G" represents a green light to indicate that a control or accelerating or movement of the car is taking place on the handling device. "Y" represents yellow lights which indicate that a retarding movement is taking place to a preselected speed or to a stop position. Other colors or arrangement of lights may, of course, be employed, if desired.

260 represents a switch located in the control tower and which is closed when it is desired to use the lights, and which supplies current to the lights from a battery or other source of power 261.

The insulated rails or tracks 208 and 209 are also connected to the control tower by means of conductors 263 and 264 which receive power from a battery or other power source 265. These wires lead to a solenoid or electromagnet 266 which when energized acts on a movable contact or switch member 267, which may make contact with a terminal 268 when the solenoid is energized, and which is drawn by a spring 269 into engagement with a contact 270 when the solenoid is de-energized. In other words, when a car connects the rails 208 and 209 in immediate proximity to the car handling device, the solenoid will draw the switch member 267 into engagement with the contact 268. When there is no car on the tracks 208 and 209, the switch member 267 will connect with the terminal 270.

When the controller lever or handle 250 is moved into reverse position, the contact member 257 thereof engages contact terminals 258 which completes a circuit including a battery or source of power 275 and two conductors 276 and 277 leading to a relay 278 which when energized moves a switch member 279 out of contact with its terminal 280, and consequently, breaks a circuit from the switch 111, which is also shown in Fig. 6, and thus prevents application of the brake to the shaft 69. By means of the controller shaft 251, the chain 30 will then be operated in a reverse direction by means of the motor 72 which is connected with the sprocket wheel shaft 69, thus reversing the movement of the chain 30.

When the controller lever or handle 250 is set into reverse position and the light switch 260 is closed, a circuit is closed between the arc-shaped contact member 253 and the reverse contact 254 by means of the contact member 252. This circuit includes a conductor 281 connecting with the arc-shaped contact member 253, light switch 260, a conductor 282, a battery or source of power 261, and then if no car is on the tracks 208 and 209, current from the source of power 261 will pass through the switch member 267, through terminal 270 and conductor 283, to the white light 284 in the left upright row of lights which are actuated only when the controller lever is in reverse position. This white light 284 is connected by means of a conductor 285 to the reverse contact member 254. If, however, a car is in operative relation to a handling device and connects the rails 208 and 209, the switch 267 will engage contact 268, and current will then flow from the movable switch member 267 to a conductor 286 leading to the red light "R" and no current will flow through the white light 284. The red light "R" is connected by means of conductor 287 with conductor 285 leading to the reverse contact 254 of the controller.

When the controller handle 250 is in engagement with the stop contact 255, as shown in Fig. 14, the movable contact member 257*a* mounted on the controller handle will contact with the terminals 259, one of which is connected with a conductor 290 and the other with a conductor 291 which includes a source of power 292. The conductors 290 and 291 are connected to the terminals of a solenoid 293 which actuates a brake 294, which may be similar in construction to the brake used on the shaft 69 and shown in Figs. 5 and 9, but which is mounted on the sprocket wheel shaft 70. This brake, therefore, will stop a reverse movement of the chain 30 and any car that may be in engagement therewith.

The lights controlled by the controller handle 250 when in stop position are lit by current passing through a circuit including the arc-shaped fixed contact 253, a conductor 281, switch 260, conductor 282, power supply 261, switch 267, and if there is no car on the tracks 208 and 209, current will pass through the conductor 263 to the white light 266, and thence by conductors 297 and 298 to the stop contact 255, and then by means of the connector 252 on the controller handle back to the arc-shaped contact member 253.

If there is a car on the tracks 208 and 209, the switch member 267 will engage contact 268 and the white light 266 will be extinguished and instead current will flow through conductor 265, conductor 297 to switch member 298 which engages contact 299 connected with conductor 300, to the purple light "P" and then through a conductor 301 to conductor 298 and back to the stop contact 255 of the controller.

If there is a car moving on the rails 208 and 209, and the endless chain 30 while stopped is engaged by the truck of a car and moved thereby, the overrunning clutch shown in Figs. 6 to 8 will close the switch 111 for applying the brake to the shaft 69. One terminal of the switch member 111 is connected to a conductor 305 which leads to a battery or source of power 306, which is connected by conductor 307 to one terminal of the brake actuating solenoid 129, the other terminal of which is connected to a conductor 308 leading to one terminal of a solenoid or electromagnet 309, the other terminal of which is connected to conductor 310 which leads to terminal 280 engaging switch member 279. This switch member is connected to a conductor 311 which leads to the other terminal of the switch 111, thus completing the circuit through the brake applying solenoid 129.

This brake actuating circuit energizes the solenoid 309 and causes the switch member 293 to move against its retaining spring into engage-

ment with the terminal 312 connected with the conductor 314 which connects with a branch conductor 315 leading to one terminal of the yellow light 313. The other terminal of this light is connected by means of conductors 316, 301 and to conductor 298 which leads back to the stop contact 255 of the controller handle. The yellow light, consequently, indicates that a car is being retarded and brought to a stop.

When the controller handle is moved into position to cause the endless chain 30 to be moved in a forward direction, as indicated by the arrow in Fig. 3, the contact member 252 connected with the controller handle 250 will connect the segment 253 with the segment 256 and thus actuate lights in the third upright column of lights, shown at the right in Fig. 14. When the controller handle is in this position, the contact member 257a thereon moves out of engagement with the terminals 259, so that the brake 294 will be released. The contact strip 256 is connected by conductor 320 with a conductor 321 leading to white light 322, green light 323 and yellow light 324. Assuming that there is no car connecting the rails 208 and 209, current will flow from the arc-shaped contact member 253 through switch 260, power source 261, switch 267, contact 270 and conductor 283 to white light 322. If there is a car in operative relation to the car handling device which connects the rails 208 and 209, the circuit including white light 322 will be broken, since switch member 267 will then contact terminal 268, thus causing current to flow to conductors 286 and 297 to switch member 298. If the clutch illustrated in Figs. 6 to 8 is not overrunning, then the switch member 298 will contact terminal 299, so that current will be conducted through conductor 300 to one terminal of green light 323, the other terminal of which is connected to conductors 321 and 320, leading back to contact member 256. If the clutch is overrunning, the solenoid 309 will be energized, thus moving switch member 298 into engagement with contact member 312, thus breaking circuit including green light 323 and causing current to flow through conductor 314 and branch conductor 325 to one terminal of yellow light 324, the other terminal being connected to conductor 321.

Any other suitable means for indicating in the control tower the condition of each track handling device may be employed, if desired.

It will be understood that various changes in the details, materials, and arrangements of parts which have been herein described and illustrated in order to explain the nature of the invention, may be made by those skilled in the art within the principle and scope of the invention, as expressed in the appended claims.

I claim as my invention:

1. A railroad car handling system for controlling the movement of railroad cars along tracks of a classification yard, including a series of movement imparting devices each including an endless chain arranged along a side of a track in position to frictionally engage a car truck frame of a car on said track, and power driven mechanism for operating said chain at a predetermined speed to increase the speed of cars engaging said chain when moving slower than said chain and to decrease the speed of cars engaging said chain when moving faster than said chain.

2. A railroad car handling device for controlling the movement of railroad cars along a track and including a power driven chain having a run thereof arranged adjacent to a track in position to be engaged by the lower surface of a truck of a car running on said track, a resilient member for supporting the portion of the chain engaged by said car truck for holding the same yieldingly and frictionally in engagement with the undersurface of said truck, and power driven mechanism for driving said chain at various desired speeds.

3. A railroad car handling device for controlling the movement of railroad cars along a track and including a power driven chain having a run thereof arranged adjacent to a track in position to be engaged by the lower surface of a truck of a car running on said track, a resilient member for supporting the portion of the chain engaged by said car truck for holding the same yieldingly and frictionally in engagement with the undersurface of said truck, power driven mechanism for driving said chain at various desired speeds, and brake mechanism acting on said chain to retard movement of said chain for decreasing the speed of a car in engagement with said chain.

4. A railroad car handling device including an endless chain arranged in parallel relation to a portion of a railroad track in a position in which the upper run of the chain may contact with a truck of a railroad car on said portion of said track, power driven mechanism for moving said chain at the desired speed, and a resilient tube inflated with fluid pressure and upon which the upper run of said chain is guided for movement while in engagement with a car truck.

5. A railroad car handling device including an endless chain arranged in parallel relation to a portion of a railroad track in a position in which the upper run of the chain may contact with a truck of a railroad car on said portion of track, power driven mechanism for moving said chain at the desired speed, a resilient tube inflated with fluid pressure and upon which the upper run of said chain is guided for movement while in engagement with a car truck, and a series of rollers mounted on said resilient tube and on which said upper run of the chain is guided.

6. A railroad car handling device including an endless chain arranged in parallel relation to a portion of a railroad track in a position in which the upper run of the chain may contact with a truck of a railroad car on said portion of track, power driven mechanism for moving said chain at the desired speed, a resilient tube inflated with fluid pressure and upon which the upper run of said chain is guided for movement while in engagement with a car truck, and a smaller tube arranged within said flexible tube and inflated with fluid at a higher pressure than the fluid in said first mentioned tube and which is of smaller outside diameter than the inside diameter of said first mentioned tube and which reinforces said first mentioned tube when the same is depressed by a truck into engagement with said smaller tube.

7. A railroad car handling device for controlling the movement of railroad cars along a track, said device including an endless sprocket chain having the upper run thereof extending parallel to the track and in position to be engaged by the undersurface of a truck moving on said track, sprocket wheels with which said chain cooperates, power driven mechanism for operating said sprocket wheels at the desired speeds, a resilient cushioning member on which the upper run of said chain travels and which yieldingly urges said chain into engagement with a car truck, and

guide means on said cushioning member including rollers engaging said upper run of said chain for retaining the same in operative relation to a car truck and to said cushioning member.

8. A railroad car handling device for controlling the movement of railroad cars along a track and including a power driven chain having the upper run thereof arranged adjacent to a track in position to be engaged by the lower surface of a truck of a car running on said track, a resilient member for supporting the upper run of said chain engaged by said car truck for holding the same frictionally in engagement with the undersurface of a truck, a cradle on which said resilient member is mounted, raising and lowering mechanism connected with said cradle for lowering the same into a position in which said chain is in an inoperative relation to vehicles moving on said track and for raising said cradle into a position in which said chain is in operative relation to car trucks, and power driven mechanism for driving said chain at various desired speeds.

9. A railroad car handling device for controlling the movement of railroad cars along a track, said device including an endless sprocket chain having the upper run thereof extending parallel to the track and in position to be engaged by the undersurface of a truck moving on said track, sprocket wheels with which said chain cooperates, power driven mechanism for operating said sprocket wheels at the desired speeds, a resilient cushioning member on which the upper run of said chain travels and which yieldingly urges said chain into engagement with a car truck, a cradle on which said cushioning member is mounted and the ends of which are arranged in spaced relation to said sprocket wheels, and raising and lowering mechanism connected with said cradle for raising and lowering the upper run of said chain independently of said sprocket wheels into operative relation to car trucks of various heights.

10. A railroad car handling device for controlling the movement of railroad cars along a track, said device including an endless sprocket chain having the upper run thereof extending parallel to the track and in position to be engaged by the undersurface of a truck moving on said track, sprocket wheels with which said chain cooperates, power driven mechanism for operating said sprocket wheels at the desired speeds, a resilient cushioning member on which the upper run of said chain travels and which yieldingly urges said chain into engagement with a car truck, a cradle on which said cushioning member is mounted, said car truck engaging a portion of said chain being normally arranged above the level of said sprocket wheels, said chain having a lower run which is normally arranged below the level of said sprocket wheels, means mounted on said cradle for supporting the lower run of said chain in fixed relation to said cradle, and mechanism for moving said cradle vertically to move the upper run of said chain into operative relation to the undersurfaces of car trucks of different heights, whereby the upper and lower runs of said chain may be raised and lowered without substantial variation in slack of the lower run of said chain.

11. A railroad car handling device for controlling the movement of railroad cars along a track and including a power driven, endless chain having the upper run thereof arranged adjacent to a track in position to be engaged by the lower surface of a truck of a car running on said track, a resilient member for supporting a portion of the upper run of said chain in position to be engaged by a car truck, said resilient member permitting a portion of the upper run of said chain to de depressed into said resilient member by a car truck, thereby reducing the slack in the lower run of said chain, and mechanism actuated by variations in slack of said chain for raising and lowering said resilient member to apply a substantially uniform pressure by said chain on car trucks having their lower surfaces arranged at different heights above the track.

12. A railroad car handling device for controlling the movement of railroad cars along a track and including a power driven, endless chain having the upper run thereof arranged adjacent to a track in position to be engaged by the lower surface of a truck of a car running on said track, a resilient member permitting a portion of the upper run of said chain to be depressed into said resilient member by a car truck, thereby reducing the slack in the lower run of said chain, a member engaging the lower run of said chain and movable in response to variations in the slack of said chain, and power actuated mechanism for raising said resilient member when the slack in said chain decreases and for lowering said resilient member when the slack in said chain increases, to enable said chain to exert substantially uniform pressures against car trucks having their lower surfaces arranged at different heights above the track.

13. A railroad car handling device for controlling the movement of railroad cars along a track and including a power driven, endless chain having the upper run thereof arranged adjacent to a track in position to be engaged by the lower surface of a truck of a car running on said track, a resilient member for supporting a portion of the upper run of said chain in position to be engaged by a car truck, said resilient member permitting a portion of the upper run of said chain to be depressed into said resilient member by a car truck, thereby reducing the slack in the lower run of said chain, power actuated mechanism for raising and lowering said resilient member, a member engaging the lower run of said chain and movable in response to variations in the slack of said chain, a piston connected with said member, a cylinder in which said piston operates and which is subjected to variations in fluid pressure according to increase or decrease in the slack of said chain, power operated means for raising and lowering said resilient member, a pressure responsive electric contact device connected with the fluid in said cylinder, and electrical connections between said pressure responsive device and said power actuated mechanism for raising said resilient member when said pressure in said cylinder decreases and for lowering said resilient member when the pressure in said cylinder increases, to enable said chain to exert substantially uniform pressures against car trucks having their lower surfaces arranged at different heights above the track.

14. A railroad car handling device for controlling the movement of railroad cars along a track and including a power driven, endless chain having the upper run thereof arranged adjacent to a track in position to be engaged by the lower surface of a truck of a car running on said track, a resilient member for supporting a portion of the upper run of said chain in position to be engaged by a car truck, said resilient member permitting a portion of the upper run of said

chain to be depressed into said resilient member by a car truck, thereby reducing the slack in the lower run of said chain, a cradle supporting said resilient member, power actuated mechanism for raising and lowering said cradle and including an electric motor, to enable said chain to exert substantially uniform pressures against car trucks having their lower surfaces arranged at different heights above the track, a cylinder containing fluid under pressure mounted on said cradle and having a piston therein, a piston rod connected with said piston and movable into and out of said cylinder in accordance with variations in the slack of said chain to vary the fluid pressure in said cylinder, a pressure responsive device connected with said cylinder and including a pointer movable in accordance with variations in pressure of said cylinder, stationary contact members one of which is engaged by said pointer when the pressure in said cylinder is low, and the other being engaged by said pointer when the pressure in said cylinder is high, a motor controller connected with said motor for operating said motor for raising and lowering said cradle, and electrical connections between said stationary contact members on said pressure responsive device and said controller for operating said motor to raise said cradle when the pressure in said cylinder is low and to lower said cradle when the pressure in said cylinder is high.

15. A railroad car handling device for controlling movement of railroad cars along a track and including an endless sprocket chain having the upper run thereof arranged adjacent to a track in position to be engaged by the lower surface of a truck of a car running on said track, a pair of sprocket wheels cooperating with said endless chain, shafts on which said sprocket wheels are mounted, power operated mechanism for turning the shaft of one of said sprocket wheels to move the upper run of said chain in a forward direction and the other power operated mechanism for turning the other sprocket wheel to move the upper run of said chain in a reverse direction, a ratchet mechanism connecting the first mentioned sprocket wheel with said shaft to permit said sprocket wheel to be rotated at a higher speed of rotation than said shaft when a car running at a higher forward speed than said sprocket chain engages said sprocket chain, switch means actuated by the over-running of said forward sprocket wheel of its shaft to close an electrical circuit, and brake means connected with the reverse sprocket wheel and applied by said electric contact means for retarding the forward motion of said chain.

16. A railroad car handling device according to claim 15, in which said ratchet mechanism includes pivoted dogs movable into and out of engagement with said forward sprocket wheel and movable about their pivots out of engagement with said forward sprocket wheel, and a part movable by said dogs when swinging about their pivots out of engagement with said forward sprocket wheel for actuating a switch to close said electric circuit.

17. A railroad car handling device according to claim 15, characterized in that said ratchet mechanism includes pivoted dogs movable about their pivots into and out of engagement with said forward sprocket wheel, teeth on said pivoted dogs, a ring with which said teeth of said dogs mesh, springs each having one end secured in fixed relation to the shaft of said forward sprocket wheel and having their other ends connected to said ring, and a switch actuated by the movement of said ring relatively to said shaft of said forward sprocket wheel for closing said electrical circuit to apply said brake means.

18. A railroad car handling device for controlling the movement of railroad cars along a track and including an endless chain, means for guiding the upper run of said endless chain into position to be engaged by the lower surface of a truck of a car running on said track, a pair of sprocket wheels cooperating with said endless sprocket chain, shafts on which said sprocket wheels are mounted, a power operated mechanism for turning the shaft of one of said sprocket wheels to move the upper run of said chain in a forward direction, and other power operated mechanism for turning the shaft of the other sprocket wheel to move the upper run of said chain in a reverse direction, bearing supports for said shafts movably mounted to permit one of said shafts to move toward the other, and springs yieldingly opposing the movement of said bearings, whereby excessive strains applied to said chain will cause said springs to yield and permit one of said sprocket wheel shafts to move toward the other sprocket wheel shaft.

19. A railroad car handling device according to claim 18, in which said sprocket wheel shaft bearings and said power operated mechanisms are mounted on trucks movable toward and from each other and in which said springs yieldingly oppose the movement of said trucks toward each other.

20. A railroad car handling device including an endless chain arranged in parallel relation to a portion of a railroad track in a position in which the upper run of the chain may contact with a truck of a railroad car on said portion of track, power driven mechanism for moving said chain at the desired speed, a resilient member which supports said upper run of said chain, a track mounted on said resilient member and including a plurality of pivotally connected links, said resilient member having upwardly extending projections, pivot pins connecting adjacent ends of said links and extending through said projections on said resilient member, and rollers mounted on said links and on which the upper run of said endless chain moves.

21. A railroad car handling device including an endless chain arranged in parallel relation to a portion of a railroad track in a position in which the upper run of the chain may contact with a truck of a railroad car on said portion of track, power driven mechanism for moving said chain at the desired speed, a resilient member which supports said upper run of said chain, a track mounted on said resilient member and including a plurality of pivotally connected links, means for securing said links to said resilient member, rollers pivotally mounted on said links and on which the upper run of said chain bears, and upwardly extending parts on the sides of said links which confine the upper run of said chain against lateral movement relatively to said track.

22. A railroad car handling device for controlling the movement of railroad cars along a track and including a power driven chain having the upper run thereof arranged adjacent to a track in position to be engaged by the lower surface of a truck of a car running on said track, a resilient member for supporting the upper run of said chain engaged by said car truck for holding the same frictionally in engagement with the undersurface of a truck, a cradle on which said

resilient member is mounted, a base on which said car handling device is mounted, frame members extending upwardly from said base and having upwardly extending guide rods connected with said cradle for guiding said cradle for upward and downward movement, power operated mechanism connected with said cradle for raising and lowering the same relatively to said guide members and including a worm, worm gears rotatably mounted on said frame members and screw-threaded rods secured to said cradle, said worm gears having screw-threaded central bores cooperating with said screw-threaded rods for raising and lowering said cradle, and means connected with said cradle and depending therefrom for supporting the lower run of said chain in relation to said cradle.

23. A railroad car handling device for controlling the movement of railroad cars along a track and including an endless sprocket chain having the upper run thereof arranged adjacent to a track in position to be engaged by the lower surface of a truck of a car running on said track, means for driving said sprocket chain at the speed to be imparted to a car, a cushioning member for holding the upper run of said chain in frictional engagement with a car truck, a cradle on which said cushioning member is mounted and which is movable vertically to move the upper run of the chain into frictional engagement with car trucks having the lower surfaces thereof at different elevations above the track, electrical connections including circuits which are closed when a car is in operative relation to said car handling device and including means for raising and lowering said cradle to place said upper run of said chain into correct relation to the truck of the car which is being handled, and a switch for breaking said circuits for lowering said cradle into a position in which the upper run of said chain will be out of operative relation to any vehicles passing along said track.

24. A car handling device according to claim 23, and including an electrical contact device and a circuit connecting the same which is completed when said switch is moved into open circuit position to move said cradle into a position intermediate of its upper and lower positions.

25. A railroad car handling device for controlling the movement of railroad cars along a track and including a power driven chain having the upper run thereof arranged adjacent to a track in position to be engaged by the lower surface of a truck of a car running on said track, a resilient member for supporting the upper run of said chain engaged by said car truck for holding the same frictionally in engagement with the undersurface of a truck, a cradle on which said resilient member is mounted, power operated raising and lowering mechanism connected with said cradle for raising and lowering the same into positions in which the upper run of said chain is in operative relation to car trucks having their lower surfaces at different elevations with reference to said track, means including electrical connections which actuate said raising and lowering mechanism for moving said cradle into correct relation to a truck of a car which is being handled, and electrical connections actuated when said car has moved beyond said car handling device and including a movable contact member which is movable in proportion to the movements of said cradle, and stationary contact members engageable by said movable contact member for closing electrical circuits for actuating said raising and lowering mechanism, for placing said cradle into an intermediate height for cooperation with the next car to be handled.

26. A railroad car handling device for controlling the movement of railroad cars along a track and including a power driven chain having the upper run thereof arranged adjacent to a track in position to be engaged by the lower surface of a truck of a car running on said track, a resilient member for supporting the upper run of said chain engaged by said car truck for holding the same frictionally in engagement with the undersurface of a truck, a cradle on which said resilient member is mounted, raising and lowering mechanism connected with said cradle for moving the same upwardly and downwardly to move said resilient member into engagement with car trucks having their lower surfaces at different elevations above said track, a reversible motor for actuating said mechanism, said car trucks when engaging said chain depressing the upper run thereof into said resilient member and thereby varying the slack in the lower run of said chain, means responsive to variations in the slack in the lower run of said chain, a circuit closing device actuated by said slack responsive means for supplying current to said motor for turning the same in one direction to raise said cradle if said slack is less than normal and for supplying current to turn said motor in the reverse direction for lowering said cradle when said slack is in excess of normal, a circuit which is closed when a car moves into operative relation to said chain, and including a solenoid, a controller actuated by said solenoid to close a second circuit leading to said closing device, a contact member connected with said cradle and movable in proportion to the movement of said cradle, and stationary contacts positioned to be engaged by said movable contact member and included in said second circuit, said second circuit being broken by said circuit closing device when the slack in said chain becomes normal, resilient means for moving said controller into position to engage other contacts when said solenoid is de-energized by the movement of a car out of operative relation to said car handling device, a third circuit including said other contacts and supplying current to said motor to return said cradle to an intermediate position, one of said stationary contacts terminating in such location that said movable contact member moves out of engagement therewith when said cradle reaches an intermediate position to stop said motor.

27. A railroad car handling device for controlling movement of railroad cars along a track and including an endless sprocket chain having the upper run thereof arranged adjacent to a track in position to be engaged by the lower surface of a truck of a car running on said track, a pair of sprocket wheels cooperating with said endless chain, shafts on which said sprocket wheels are mounted, power operated mechanism for turning the shaft of one of said sprocket wheels to move the upper run of said chain in a forward direction and other power operated mechanism for turning the other sprocket wheel to move the upper run of said chain in a reverse direction, a ratchet mechanism connecting the first mentioned sprocket wheel with said shaft to permit said sprocket wheel to be rotated at a higher speed of rotation than said shaft when a car running at a higher forward speed than said sprocket chain engages said sprocket chain,

switch means actuated by the overrunning of said forward sprocket wheel of its shaft to close an electrical circuit, said circuit including a signal, a control tower in which said signal is located, a controller in said control tower connected with said power operated mechanisms for said sprocket wheels to control the movement of said chain, and a second circuit including other signals and said controller for indicating the direction of movement of said chain, and a third signal circuit including said controller and other signals in said control tower and which is completed when said controller is in position to stop movement of said chain.

28. A railroad car handling device for controlling the movement of railroad cars along a track and including a power driven chain having the upper run thereof arranged adjacent to a track in position to be engaged by the lower surface of a truck of a car running on said track, a resilient member for supporting the upper run of said chain engaged by said car truck for holding the same frictionally in engagement with the undersurface of a truck, a cradle on which said resilient member is mounted, raising and lowering mechanism connected with said cradle and actuated by a motor, electrical connections including said motor for normally positioning said cradle in an intermediate position and for raising and lowering said cradle when cars in operative relation to said car handling device have their lower truck surfaces respectively higher and lower than average, another circuit including said motor and which is completed when a car has moved from said handling device beyond the same for moving said cradle into a position intermediate of its upper and lower positions, and a manually controlled circuit including said motor for causing said motor to move said cradle into its lower position to enable vehicles to pass on said track without interference with said car handling device.

29. A railroad car handling device for controlling the movement of railroad cars along a track and including a power driven sprocket chain having the upper run thereof arranged adjacent to a track in position to be engaged by the lower surface of a truck of a car running on said track, a resilient member for supporting the portion of the chain engaged by said car truck for holding the same yieldingly and frictionally in engagement with the undersurface of said truck, sprocket wheels engaging said chain, a power driven

mechanism for each of said sprocket wheels, one of which is driven for pulling the upper run of said chain in one direction and the other of which is driven for pulling the upper run of said chain in the opposite direction, and a brake for each sprocket wheel, said brakes when applied placing said upper run of said chain under tension.

30. A railroad car handling system for controlling the movement of railroad cars along tracks of a classification yard, including a series of movement imparting devices each including an endless chain arranged along a side of a track in position to frictionally engage a car truck frame of a car on said track, power driven mechanism for operating said chain at a predetermined speed to increase the speed of cars engaging said chain when moving slower than said chain, and a brake mechanism acting on said chain and which retards the movement of said chain when cars engaging said chain run at speeds in excess of that of said chain.

31. A movement imparting device according to claim 30 which includes mechanism for automatically applying said brake mechanism to said chain when a car in engagement with said chain moves faster than said chain is driven by said power mechanism.

32. A railroad car handling system for controlling the movement of railroad cars along tracks of a classification yard, including a series of movement imparting devices each including an endless chain arranged along a side of a track in position to frictionally engage a car truck frame of a car on said track, power driven mechanism for operating said chain at a predetermined speed to increase the speed of cars engaging said chain when moving slower than said chain, a brake mechanism acting on said chain and which retards the movement of said chain when cars engaging said chain run at speeds in excess of that of said chain, and mechanism for reversing the direction of travel of said chain.

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