W. P. LAMAR.

PASSENGER AND FREIGHT TRANSFER SYSTEM.

APPLICATION FILED DEC. 12, 1916. RENEWED JAN. 14, 1919.

1,313,091. Patented Aug. 12, 1919.

3 SHEETS—SHEET 1.

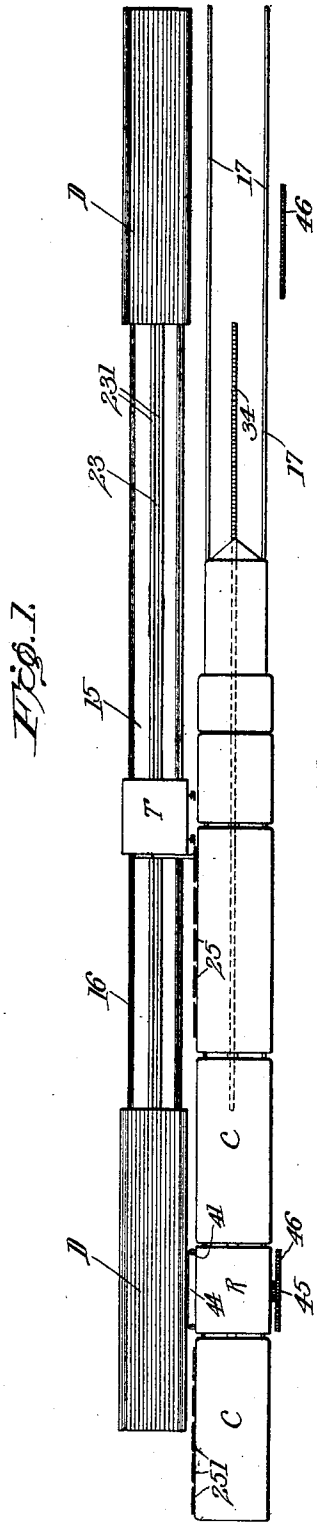


Fig. 1.

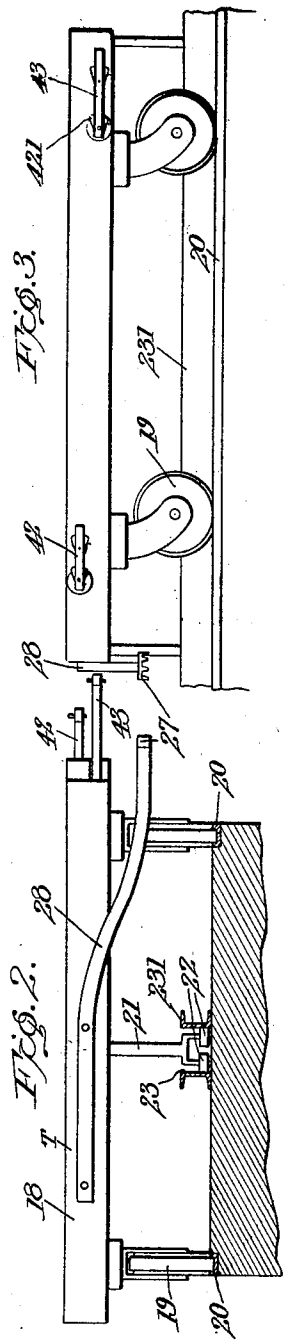


Fig. 3.

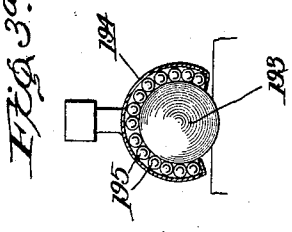


Fig. 3a.

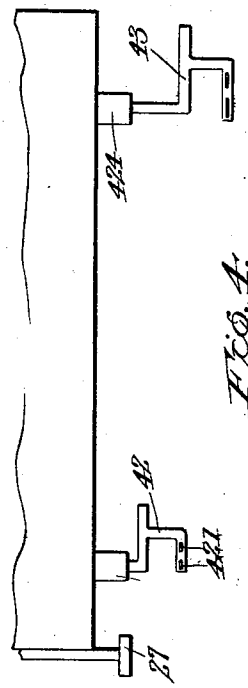


Fig. 4.

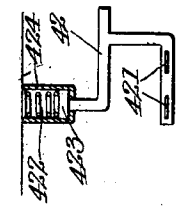


Fig. 4a.

Fig. 2.

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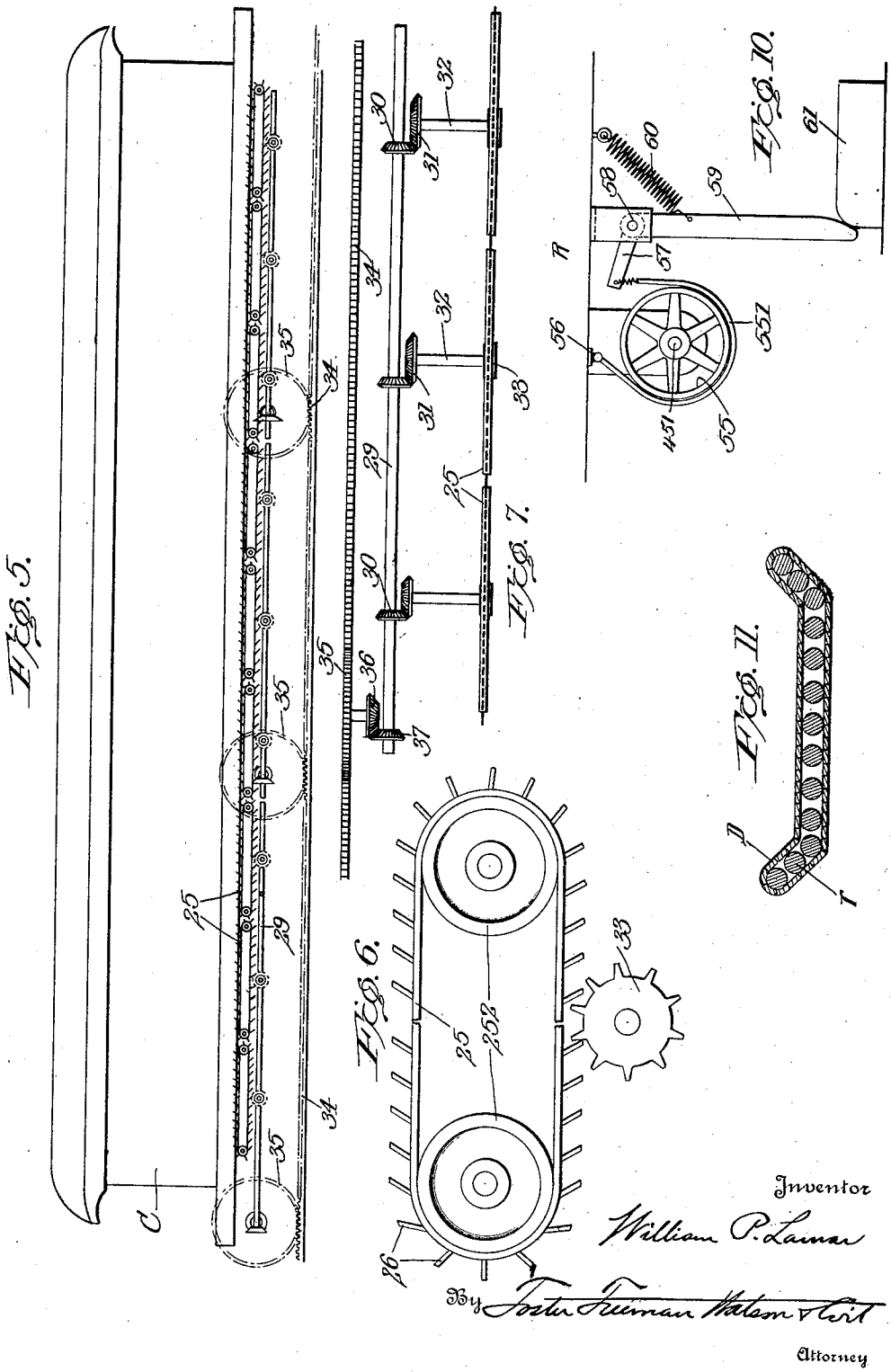
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3 SHEETS—SHEET 3.

Fig. 9.

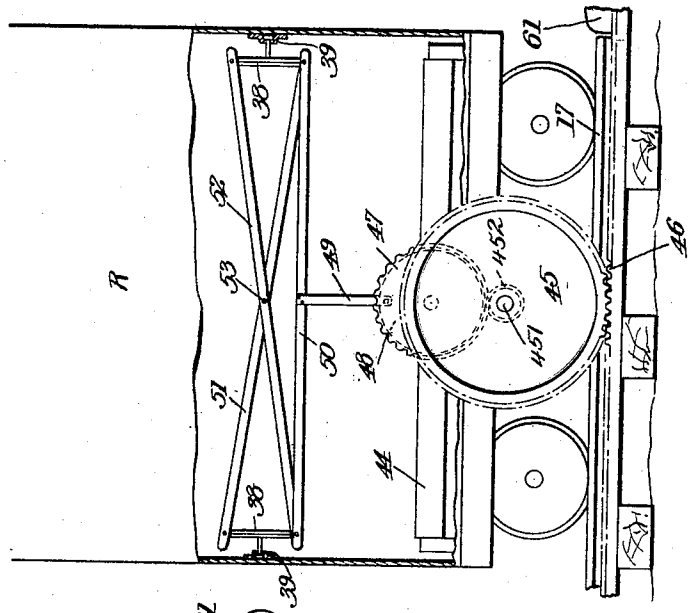
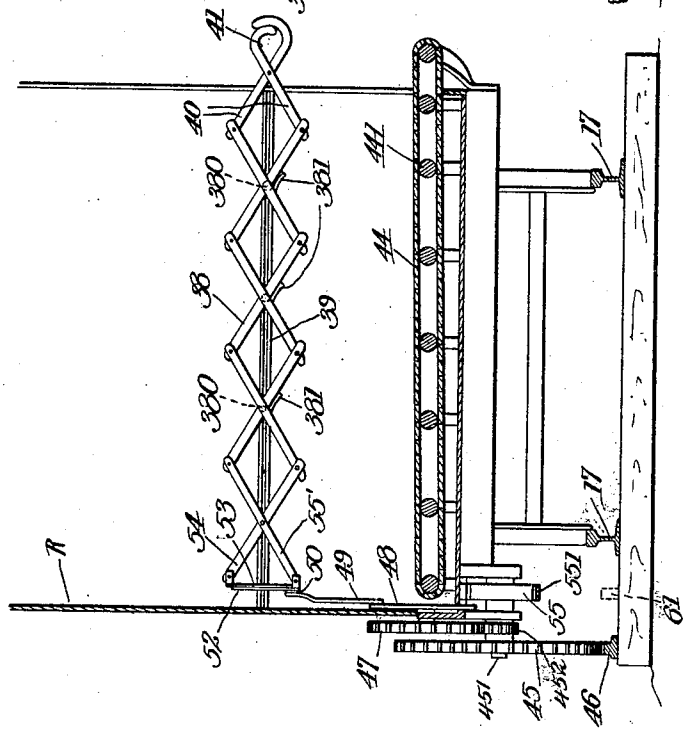


Fig. 8.



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UNITED STATES PATENT OFFICE.

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PASSENGER AND FREIGHT TRANSFER SYSTEM.

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Application filed December 12, 1916, Serial No. 136,496. Renewed January 14, 1919. Serial No. 271,161.

To all whom it may concern:

Be it known that I, WILLIAM P. LAMAR, a citizen of the United States, and resident of Atlanta, county of Fulton, State of Georgia, have invented certain new and useful Improvements in Passenger and Freight Transfer Systems, of which the following is a specification.

My invention relates to an apparatus whereby passengers, freight and baggage may be transferred to and from a moving train. At present the stops made by a through train on the main line require a considerable amount of time and if the delay at each station can be partly or completely eliminated it would be possible for trains to make much better time, and less rolling stock would be necessary to handle a given amount of traffic on the railway.

The principal object of this invention, therefore, is to provide a system of handling passengers and freight at the railroad stations which will avoid the necessity of stopping the train at the station.

The above and other objects and the novel features of my invention will be apparent from the following description taken in connection with the drawings, in which:—

Figure 1 is a plan view of a part of a main line track and a station side track used in carrying out my invention;

Fig. 2 is an end view of a transfer car embodying my invention, the platform and track upon which it runs being shown in section;

Fig. 3 is a side view of a transfer car used to carry out the invention;

Fig. 3ª is a detail view of a modified form of caster wheel for the transfer car;

Fig. 4 is a plan view of part of the transfer car;

Fig. 4ª is a detail view of one of the hooks carried by the transfer car;

Fig. 5 illustrates a coach or other railway vehicle equipped with means for accelerating or retarding the transfer car;

Fig. 6 is a detail view of one of the accelerating or retarding chains carried by the coach shown in Fig. 5;

Fig. 7 is a view of part of the gearing and part of a rack by means of which the successive chains on the coach are driven;

Fig. 8 is a transverse sectional view of the reception car in the train, also showing the main line track and devices along it for setting in operation the means for causing the transfer car to be pushed off the reception car or pulled onto the same;

Fig. 9 is a side view of the reception car and part of the track looking at Fig. 8 from the left with the left side of the car partly broken out;

Fig. 10 illustrates the brake for controlling the operation of the gearing of the mechanism shown in Figs. 8 and 9, with the means for actuating it;

Fig. 11 is a sectional view of an endless conveyer or treadmill for carrying the transfer cars.

In carrying out the invention I provide a platform 15 at each station and thereon mount a short section of track 16 parallel to and at a slight distance from the main line track 17. In double track construction the platform 15 is located between the main line tracks and a passage leads under or over the main line track from the station to the platform where the passengers get on and off of the transfer car.

The transfer car T may be of any suitable construction and in the drawing I have shown it diagrammatically as consisting of a platform or floor 18 suitably mounted on wheels 19 running in grooved rails 20 on the upper side of the platform 15. The wheels 19 may be caster wheels mounted so as to turn and move the car in any direction. It is necessary to provide guides for the car T while it is on the platform 15. The guiding means consists of arms 21 rigidly connected to the under side of the platform 18 and carrying rollers 22 at the lower end. The lower end of each bar 21 carrying the rollers 22 extends into a groove 23 formed by channels 231 secured on the upper side of the platform 15 and the rollers 22 run on opposite sides against the channel members.

The passengers, freight and baggage are loaded on the transfer car T while the latter is standing stationary at a point about midway between the ends of the short section of track 16. In order to safely transfer the car T to the moving train it is necessary to bring the transfer car T up to a speed nearly equal to that of the moving train and then by means of suitable mechanism to be described, the transfer car is pulled aboard the moving train. Each train is equipped with one or more reception cars R, the details of which will be described hereinafter. In the train ahead of and following each reception car are a number of

coaches C, one of which is diagrammatically shown in Figs. 1 and 5. On the under side of each of the coaches C are a plurality of endless chains 25 such as the one shown in Fig. 6. The chains 25 project beyond the sides of the coaches C and the teeth 26 on the upper run thereof are adapted to engage the teeth of a rack 27 on the outer end of a bar or support 28 which is fastened to one end of the transfer car T. Since the transfer car T is stationary it will be necessary, in order to avoid shocks and injury to the passengers and freight thereon to start it at a slow speed and gradually accelerate it until its speed is nearly equal to that of the train. This is accomplished by driving the chains 25 so that their upper sides which engage the rack 27 will travel in a reverse direction to that of the train. The first chain to engage the rack 27 will travel in a direction reverse to that of the train and at a speed slightly less than that of the train, while the speeds of the succeeding chains will be slower and the chain engaging the rack 27 just before the car T is to be transferred to the reception car R will be geared so as to travel very slowly in a reverse direction so that the transfer car T will move at about the same speed as the train when it is pulled aboard the reception car.

When a transfer car loaded with passengers and freight is pushed off the reception car the chains 251, similar to the chains 25, on the coaches following the reception car will travel in a direction and at speeds adapted to gradually retard the transfer car. In order to do this the upper side of the chain 251 next following the reception car will travel in a reverse direction to that of the moving train but at a slow speed while the succeeding chains will gradually increase in speed until the last chain, the upper side of which will travel in a reverse direction to that of the train and at substantially the same speed as the train.

In Fig. 7, I have diagrammatically shown the way in which the chains on the under side of the coaches may be driven. A shaft 29 consisting of several sections extends longitudinally beneath the coach and carries a plurality of bevel gears 30, each of which meshes with a bevel gear 31 carried on the end of a short shaft 32. The short shafts 32 are each provided with a gear or sprocket 33 which meshes with the teeth on the lower run of the chain 25 to drive the latter. In order to obtain the different speeds for the successive chains 25, the gears 31 are successively of different diameters. A rack bar 34 secured along the track is adapted to engage a gear 35 connected to rotate the gear 36. The gear 36 meshes with a gear 37 on the line shaft 29 and therefore when the gear 35 reaches the rack bar 34 located at the railroad station, the shaft 29 under the coach will be rotated and the chains set in motion to accelerate or retard the transfer car T.

At each end of the track section 16 and about an inch higher than the same there is an endless transversely extending conveying device or treadmill D which is normally at rest and upon which the transfer cars are moved when they are to be pushed off or pulled aboard the reception car. One of these devices is illustrated in detail in Fig. 11 and consists of an endless flexible belt of suitable material running over rollers r and as shown, the ends of the conveying member D are guided upwardly on an incline. These inclined ends keep the transfer car from accidentally running off of the conveying device. The flexible floor of D is laid upon parallel longitudinal rods about thirty feet long fitted at either end into a metal beam, the ends of which turn up. By providing the car T with wheels similar to the one shown in Fig. 3ª it will be possible to dispense with the treadmills D since the large ball 193 is fitted in a casing 194 secured to the lower side of the frame and provided with ball bearings 195, and it may move in any direction. When the transfer car to be transferred to a moving train reaches this conveying device D it is ready to be pulled aboard the moving train and this is accomplished by means of a pair of lazy tongs devices 38 guided in grooved rails 39 on opposite end walls of the reception car. The rear ends of the tongs run on rollers and are fastened securely to the side wall of the reception car to resist the strain when the transfer car is pulled aboard the train. A pin projects out horizontally at each of the pivotal points formed by the diamond shaped figures of the tongs 38, and rollers 380 are mounted on these projecting pins, the rollers being adapted to be guided in slots 39. These rollers increase in size from the rear to the front and at the limit of their forward movement downwardly and forwardly inclined slots 381 are formed in the guideways 39 so as to receive the rollers 380 and enable the tongs 38 to let the car T move down onto the horizontal floor of the treadmill D. This arrangement also provides a stop for the outward movement of the members 38. The lazy tongs device 38 has two end levers 40 which are curved and overlap at their outer ends to form a ring when the lazy tongs device is extended. The rings 41 on the pair of lazy tongs devices 38 are arranged to engage hooks 42 and 43 carried by brackets bolted to the outer side of the transfer car T. The hooks 42 and 43 are mounted at different heights on and at different distances from the side of the car T and the lazy tongs devices 38 extend out of the side of the reception car different distances so that they will interlock with the proper hooks on the transfer car. The hooks are

each provided with spring latches 421 to keep the rings 41 in place thereon, and the shanks of these hooks fit in casings on the car T and bear against springs in said casings which will take up the shock. The hooks 42 and 43 are reversed in direction in the transfer car which is to be pushed from the reception car onto the transfer track 16. The floor of the reception car consists of an endless traveling conveying device 44 which extends outside of the reception car and its upper run travels inwardly when a car is to be transferred to it whereas the upper run travels outwardly when a car is to be transferred from it. The outer end of the conveying device 44 is arranged to pass close to the conveying devices D on the track 16 and when the transfer car is rolled to or from the devices D from or to the reception car the transfer car wheels 19 bridge the space between the conveyer devices D and conveying member 44 and roll the transfer car across the space between them. When the car T is discharged from the reception car, the lazy tongs push the car T sidewise into position to be guided by the groove 23.

The mechanism for operating the lazy tongs devices 38 consists of a gear wheel 45 which is carried by a shaft 451 mounted in suitable bearings on the lower side of the floor of the reception car R and which is adapted to mesh with the rack bar 46 located at the proper point along the main line track. The shaft 451 also carries a pinion 452 which rotates with the gear 45. The pinion 452 meshes with a gear 47 to rotate the latter, and connected to the inner end of the shaft which carries the gear 47 there is a crank and brake wheel 48 to which one end of a connecting rod 49 is attached. The upper end of the connecting rod 49 is secured to a bar 50 and the ends of the bar 50 are suitably connected to the lower ends of a pair of lazy tongs 51 and 52. The levers 51 and 52 are pivoted together at 53 and are also connected at their ends to the upper and lower end levers 54 and 55′ of the pair of lazy tongs devices 38. The lazy tongs devices are therefore extended when the rod 49 is raised and are drawn inwardly and the ring 41 is opened when the rod 49 is lowered. By means of this arrangement the lazy tongs devices will push off and pull on the transfer cars. In order to prevent the overthrow of the wheels 45 and 48 and their connections, and to cause their operation at the proper time, I provide a brake band 551 which passes around a part of the outer surface of the wheel 55 fixed on the shaft 451 to which the gear 45 and pinion 452 are connected. The brake band 551 is secured at 56 to the floor of the reception car and its other end is secured to the arm 57 of a double arm lever pivoted at 58 on the under side of the car. The other arm 59 of the double arm brake operating lever is connected to one end of a spring 60 and the other end of the spring 60 is connected to the bottom of the car and tends to pull the arm 59 of the double arm lever outwardly to normally release the brake band 551. At the proper point along the track there is located a tripping block 61 which is adapted to engage the lower end of the arm 59 which raises the arm 57 and causes the brake band 551 to engage the wheel 55 to stop its movement and during the period that the brake band 551 is in this position the lazy tongs devices will not be operated but will remain in the position in which they are set but as soon as the brake band 551 is released the wheel 45 engages the rack 46 and operates the lazy tongs to either push out the transfer car or pull it in.

The operation of my transfer system will be apparent from the foregoing description. After the transfer car with the passengers and freight thereon has been pulled aboard the reception car the passengers will go to their seats in the coaches and the freight will be unloaded. Then the transfer car will be ready to be loaded with passengers and freight for discharge at the next station. When the passengers are discharged and the transfer car comes to a stop between the conveying devices D the passengers get off and the freight is unloaded to prepare the car for passengers and freight to be transferred to the next train passing in the same direction. The transfer system described in this application may also be employed in street railway traffic. While I have shown and described the invention in detail, I do not wish to be limited to the exact devices herein shown and described for carrying it into practice, as it will be obvious that various other means may be employed for that purpose without departing from the spirit of the invention.

Having thus described the invention what is claimed is:

1. In a transfer system of the class described, the combination of a transfer car to be transferred to a moving vehicle, means carried by the moving vehicle for accelerating said transfer car to the speed of the vehicle and means on the vehicle for transferring said car to the vehicle.

2. In a transfer system of the class described, the combination of a stationary transfer car to be loaded with articles or passengers to be transferred to a moving train, means carried by the moving train for accelerating the transfer car to the speed of the train, and means carried by the train for transferring said car aboard the train when the speed of the train and car are equal.

3. In a transfer system of the class described, the combination of two separate

tracks, one for a moving vehicle, a transfer car adapted to run along the other track, an endless conveying device traveling transversely of said other track near the end thereof, means carried by the moving vehicle for accelerating the transfer car to the speed of the vehicle, and means carried by the moving vehicle for engaging the transfer car and guiding it aboard said vehicle when said transfer car reaches the conveying device.

4. In a transfer system of the class described, the combination of a main line track, a track section extending along said main line track, a transfer car adapted to run on said track section and adapted to carry the articles or passengers to be transferred to a moving train on the main line track, a plurality of devices carried by the train on the main line track for gradually accelerating said transfer car to the speed of the train, means carried by the train adapted to engage parts on said transfer car when the transfer car and train travel at the same speed, and means for actuating said engaging means to cause it to pull the transfer car aboard the train when said transfer car and train travel at the same speed.

5. In a transfer system of the class described, the combination of a main line track, a short side track parallel to the main line track, and two spaced endless conveying devices traveling transversely of said side track, one of said devices being adapted to receive transfer cars discharged from a train on the main line track and the other conveying device being adapted to carry transfer cars to be transferred to trains traveling on the main line track.

6. In a transfer system, the combination of a transfer car for carrying articles or passengers to be transferred to or from a moving train, a toothed member on said transfer car, and means on the train for accelerating or retarding said transfer car to transfer it to or from the train, said accelerating or retarding means comprising a series of traveling elements adapted to engage the toothed member on said transfer car, the successive traveling elements in said series moving at different speeds, for the purpose set forth.

7. In a transfer system, the combination of a transfer car for carrying articles or passengers to be transferred to or from a moving train, a toothed member on said transfer car, and means on the train for accelerating or retarding said transfer car to transfer it to or from the train, said accelerating or retarding means comprising a series of endless traveling chains having teeth adapted to engage the toothed member on said transfer car, the successive chains of said series operating at slightly different speeds in gradual progression to provide a gradual acceleration or retardation of the transfer car, substantially as set forth.

8. In a transfer system, the combination of a transfer car adapted to be loaded with articles and passengers to be transferred to a moving train, a toothed member carried by said transfer car, and means for accelerating or retarding said transfer car as it is transferred to or from the moving train, said means comprising shafting located beneath coaches of said train, gears carried by said shafting, other gears driven by said gears on the shafting and a series of endless toothed chains beneath coaches of said train, said chains being connected to be driven at progressively different speeds by said other gears, said chains successively engaging the toothed member on said transfer car and gradually accelerating or retarding it, substantially as described.

9. In a transfer system, the combination of a transfer car adapted to carry articles or passengers to be transferred to or from a vehicle, means engageable by a part on the vehicle for moving said transfer car and for accelerating or retarding said movement, and means on the vehicle for transferring said car to or from the vehicle, said transferring means comprising a device adapted to engage a part on said transfer car, gearing for operating said device and means for causing the operation of said gearing.

10. In a transfer system, the combination of a transfer car adapted to carry articles or passengers to be transferred to or from a vehicle and means on the vehicle for transferring said car to or from the vehicle, said transferring means comprising a lazy tongs device, gearing for operating said lazy tongs device, and a rack for causing the operation of said gearing.

11. In a transfer system, the combination of a transfer car adapted to carry articles or passengers to be transferred to or from a vehicle and means on the vehicle for transferring said car to or from the vehicle, said transferring means comprising a pair of lazy tongs, means for guiding the lazy tongs, gearing for operating the lazy tongs, a rack for operating the gearing, a brake for limiting the action of the gearing, a trip for operating said brake, and a spring for restoring said trip and releasing said brake.

12. In a transfer system, the combination of a main line track, a short side track parallel to the main line track, endless conveying devices traveling transversely of the short side track at the ends thereof, transfer cars for carrying articles and passengers to be transferred to or from the train moving on the main line track, means on the train for accelerating or retarding the transfer cars and means on the train for transferring the transfer cars to or from a car of the train, said transferring means comprising

an endless traveling device adapted to be disposed opposite the traveling devices on the short side track when the transfer cars are to be transferred to or from the moving train.

13. In a transfer system of the class described, a transfer car comprising a body, wheels supporting said body for movement in any direction, a toothed member mounted on said body and engageable by a part on a moving vehicle, whereby said car is accelerated or retarded, and hooks carried by said body and adapted to be engaged by transferring means on a moving vehicle.

14. In a transfer system of the class described, a reception car for carrying transfer cars, said reception car comprising a floor consisting of a transversely traveling endless conveying device, extensible means on said reception car for pulling a transfer car aboard the reception car and for pushing a transfer car off of the reception car, means for operating said extensible means and means for controlling the amount of operation of said operating means.

15. In a railway system, the combination of a main line track, a short section of track extending along said main line track at a station of said main line, a car adapted to run on said short track section, and a train on the main line carrying means to engage said car for movement and to accelerate or retard said movement.

16. In a railway system, the combination of a main line track, a short section of track extending along said main line track at a station of said main line, a car adapted to run on said short track section, a train on the main line carrying means to engage said car for movement and to accelerate or retard said movement, and means on said train to engage and pull the car aboard the train or discharge it from the train.

In testimony whereof I affix my signature.

WILLIAM P. LAMAR.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."