

Feb. 16, 1937.

M. A. KENT

2,070,792

PARKING CAR

Filed Jan. 30, 1928

3 Sheets-Sheet 1

Fig. 1.

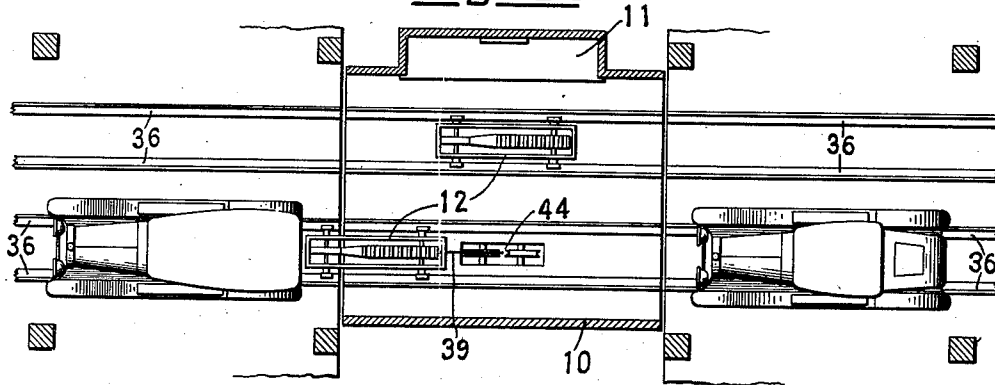


Fig. 2.

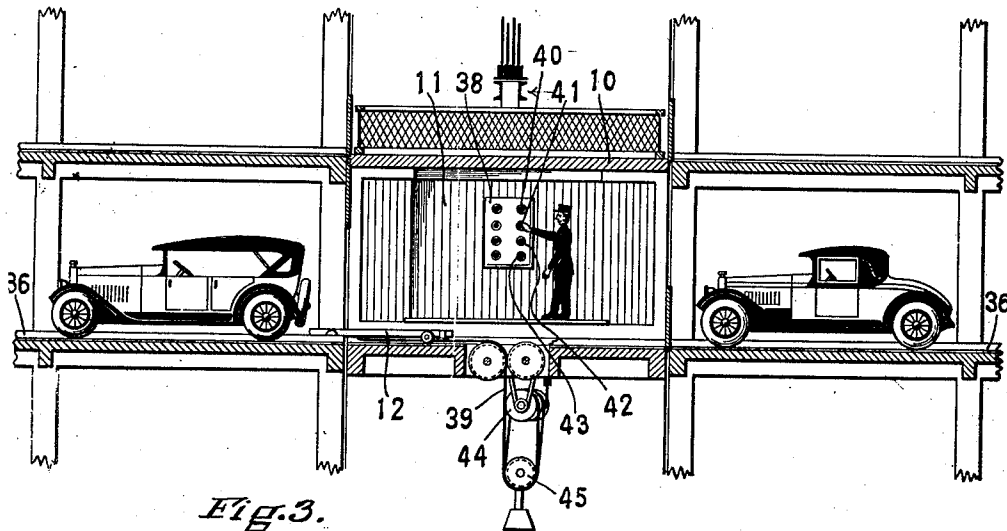
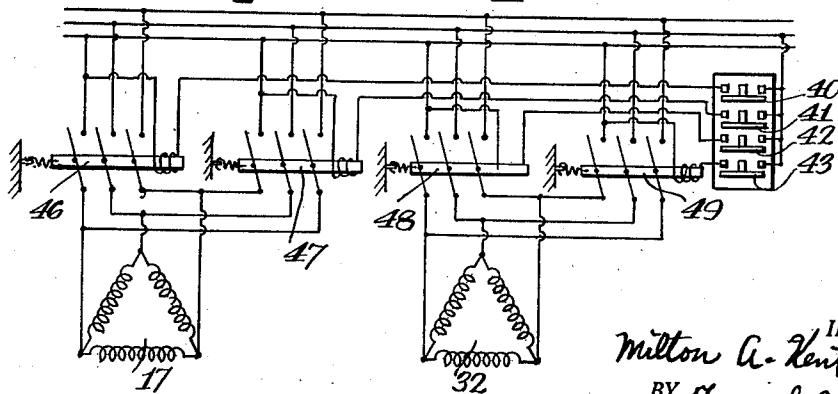


Fig. 3.



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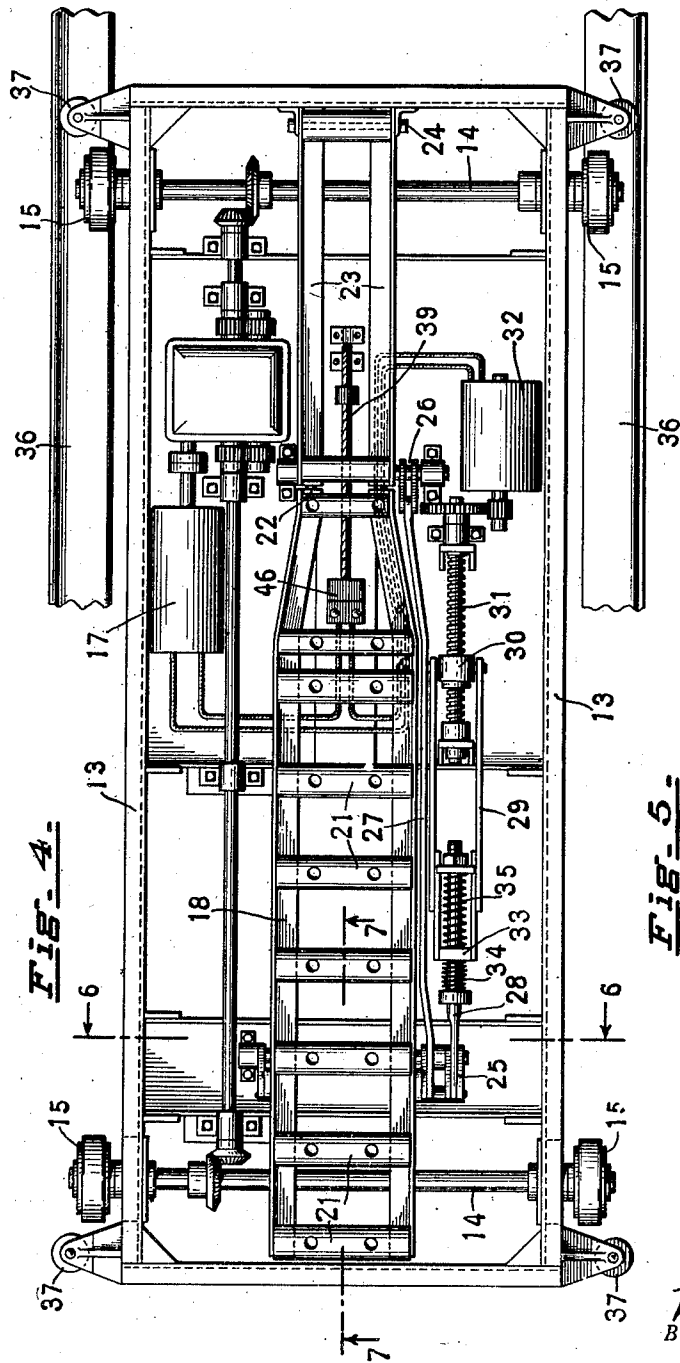
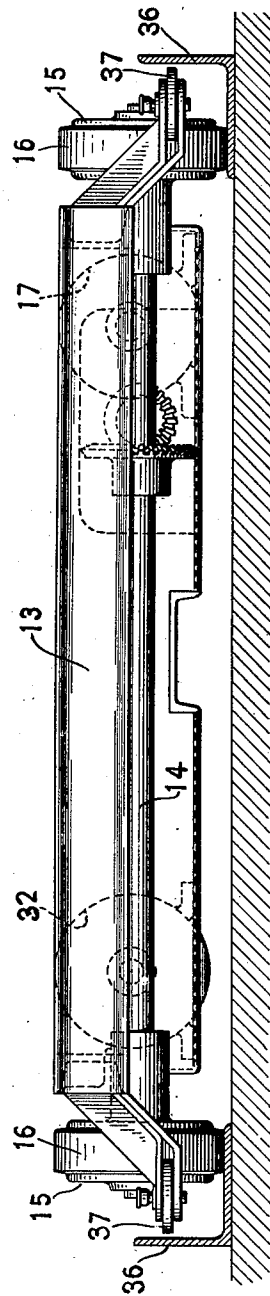


Fig-5-



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Fig. 6-

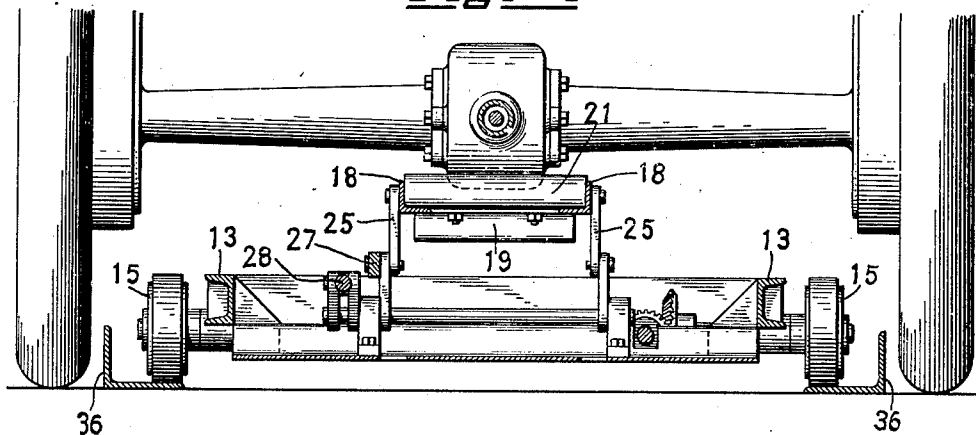
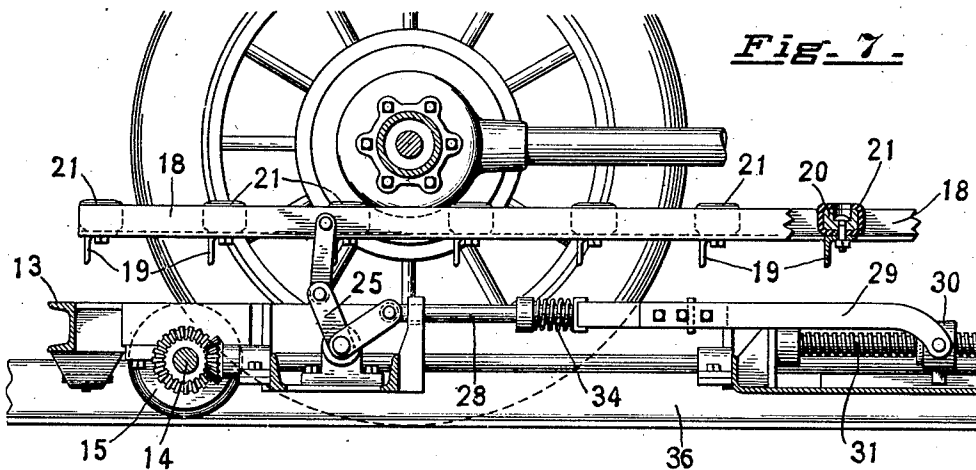


Fig. 7-



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UNITED STATES PATENT OFFICE

2,070,792

PARKING CAR

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mesne assignments, to Electric Garages, Inc.

Application January 30, 1928, Serial No. 250,419

14 Claims. (Cl. 254—35)

This invention relates to a system of power parking for use in garage buildings, and aims to provide for the expeditious handling of the maximum number of motor cars, or other vehicles, in the space available.

A particular object is to provide a garage structure having a vertical elevator to transport the vehicles to and from the upper floors, and having power mechanism under control of the elevator operator for moving the cars horizontally between the parking spaces and the elevators.

A particular feature of the invention resides in the electrically operated parking car by means of which the vehicles are moved horizontally, and in the improved means provided for coupling the parking car with the vehicle.

The invention also provides novel means for guiding the parking car and the vehicle while they are moving horizontally.

Further features of novelty are found in the arrangement for controlling and conducting the electrical currents by means of which the parker is operated.

Further objects and advantages will become apparent as the description proceeds.

While a preferred embodiment of the invention has been disclosed for purposes of illustration, it should be understood that various changes may be made in the structure without departing from the spirit and scope of the invention as hereinafter set forth and claimed.

Fig. 1 is a horizontal partial section through a garage building incorporating the invention.

Fig. 2 is a vertical section through the structure shown in Fig. 1.

Fig. 3 is a wiring diagram showing a simplified method of controlling the parking car.

Fig. 4 is a plan view of the parking car.

Fig. 5 is an end elevation of the parking car.

Fig. 6 is a section on line 6—6 of Fig. 4 showing the parker coupled to a vehicle.

Fig. 7 is a partial section on line 7—7 of Fig. 4 showing the parts in the position of Fig. 6.

Referring to the drawings more particularly it will be seen that the garage includes a vertical elevator 10, of any preferred type, by means of which the vehicles can be moved from one floor to another. The elevator includes an operator's stand 11 from which the vertical movements of the elevator can be controlled by any well-known or suitable means, not shown.

Associated with the elevator is a parking car 12, which is self-propelled and is adapted to engage a vehicle and move it horizontally to or

from the elevator. Parking spaces are provided on both sides of the elevator, and the parking car can run off either end of the elevator in handling a vehicle.

The details of the parking car are shown clearly in Figs. 4 and 5, and include a frame 13 carrying a cross axle 14 near each end. Wheels 15 are keyed on the ends of axles 14, and these wheels are provided with tires 16 of rubber or any preferred material, and are driven from a reversible motor 17 through suitable gearing.

The parking car is provided with power-operated means for forming a towing connection with a vehicle. In the form illustrated this coupling means is particularly adapted to engage the differential of a motor vehicle, although obviously it could be arranged to engage any suitable part of any wheeled vehicle. The coupler disclosed comprises broadly a frame carrying cross members together with means for elevating the frame into engagement with the differential. The coupler frame 18 and cross members 19 are built up of angle members, and the upper sides of cross members 19 carry wooden rails 20 covered with rubber as at 21. Obviously, any preferred method of covering the cross members 19 to protect the differential from injury could be used.

In the embodiment illustrated the front end of the frame 18 is pivoted at 22 to a guide frame 23, which in turn is pivoted at 24 to the front of the car frame 13. The elevating mechanism includes toggle devices 25 and 26 connected by a connecting rod 27, and operated by a pull rod 28. A yoke 29 connects the pull rod 28 to a nut 30 cooperating with a screw rotated through gearing by a reversible motor 32. The yoke 29 does not have a positive connection with the pull rod 28, but carries a block 33 sliding over the rod 28. Coiled springs 34 and 35 surround the rod 28 and engage the block 33, the outer end of each spring abutting against a stop secured to the rod 28.

When it is desired to engage the parking car with a motor vehicle, the parking car is moved to a position under the vehicle with the coupler frame 18 below the differential of the vehicle. The motor 32 is then operated to pull the nut 30 toward the motor, which movement is transmitted through the spring 35 to pull rod 28 and causes toggle devices 25 and 26 to simultaneously raise both ends of the coupler frame. Should the parking car be in such a position that as the coupler frame is raised the differential is engaged on its front and rear surfaces by the cross

members of the frame, an effective towing connecting with the differential is formed. Due to the transmission of the elevating force through spring 35, the cross members are resiliently pressed against the differential, preventing injury to the differential and holding the cross members firmly in engagement with the differential even if the differential should move vertically relative to the parking car during the towing operation. By simultaneously elevating both ends of the coupler frame, the frame is held in substantially horizontal position when engaging the differential, so that the differential is firmly gripped for movement of the vehicle either forward or backward. If upon initially raising the coupler frame, a single cross member should engage with the lowest point of the differential, then upon towing movement of the car the differential would slip off this single cross member, and the spring 35 would further elevate the coupler frame to engage the differential in the manner illustrated in Fig. 7. The spring 34 cushions the return movement of the elevating mechanism.

From an inspection of Figs. 6 and 7, which show the parking car coupled to an automobile, it will be clear that when the parts are in this coupled position all of the wheels of the automobile are in contact with the floor. This means that the parking car does not have to carry the automobile, but merely tows it while the automobile is supported on its own wheels.

The invention contemplates the provision of means for guiding the parking car in its towing movements, and this may be done by a track composed of two L-shaped track members 36, disposed on top of the floor with their horizontal branches projecting toward each other, as shown in Fig. 5. These inwardly projecting branches provide tracks upon which the wheels 15 of the parking car roll, thereby removing wear from the garage floor, and each side of the parking car carries one or more horizontal guide wheels 37 engaging the vertical branches of the track members. These track members are spaced such a distance apart that the outer surface of their vertical branches cooperate with the inner sides of the tires to guide the motor vehicle should the wheels of the vehicle not be set to run exactly parallel to the track of the parking car. The arrangement thus provides for three distinct uses for the track members 36, and makes for economy of construction and operation.

The tracks 36 are laid on the elevator and on the garage floors in alinement with the elevator tracks, as will be clear from Figs. 1 and 2. The elevator may be furnished with one or more of the parking cars according to the circumstances.

The elevator is provided with a control panel 38, from which a single cable 39 carries the wires to the parking car. The control panel includes buttons 40 and 41 connected to the motor 17 in such a way that pressing button 40 causes the car to run to the right (Fig. 2) while pressing button 41 causes the car to run to the left. Similarly buttons 42 and 43 control up and down operation, respectively, of the elevating motor 32. Suitable arrangements can be provided for preventing injury to the mechanism should two buttons be pressed simultaneously. The cable 39 carries the five wires for controlling the motors 17 and 32, together with wires for a lamp or any other electrical devices to be carried by the parking car. A complete set of control buttons are

furnished for each parking car and suitable connections are provided for supplying current to the control panel.

The reversible motor 17 is controlled by switches 46 and 47, which are spring biased toward open position and are closed by solenoids under the control of push buttons 40 and 41. Motor 32 is similarly controlled by switches 48 and 49 operated by push buttons 42 and 43.

The cable 39 passes over a series of sheaves 44 attached to the elevator, and a cooperating series of weighted sheaves 45 suspended by the cable. This arrangement provides for a simple and efficient method of taking up and paying out the cable 39.

A detachable connector 46 (Fig. 4) permits the disconnection of a disabled parking car and its expeditious replacement by a spare car.

The system is operated in the following manner:

When a motor car has been driven on to the receiving floor of the garage and left in a position alined with a track, the elevator is brought to the level of that floor. The operator then presses the button 40, causing the parking car to move to the right from the elevator until it is in proper position under the automobile, whereupon he releases button 40 and presses button 42 to raise the coupler frame into engagement with the differential. He next presses button 41, towing the automobile to the left until it is in on the elevator and releases button 41. Now he operates the elevator to the floor having a vacant parking space, and then tows the automobile to either right or left to the vacant space. Button 43 is then pressed to lower the coupler frame, the parking car is returned to the elevator, and the attendant takes the elevator again to the receiving floor or loads an out-going automobile onto the elevator.

The structure disclosed herein permits the construction of the parking car with an over-all height of as low as seven inches, so that it can roll over the top of the floor and run freely under an automobile resting on the floor. In this way the system avoids the use of expensive pits for the parking cars or racks for supporting the automobiles.

The elevators are preferably of the self-leveling type, and the combination of the elevator with the centralized control of the parking car gives the ability to rapidly and safely switch automobiles from one parking space to a vacant parking space on another floor. As the result, it is quite feasible to park the cars two deep in the parking spaces, since the front car can be quickly removed to get at the car in the second row back.

I claim:

1. A parking car comprising a body frame, wheels supporting the body frame, a coupler frame carried by the body frame and adapted to be elevated into engagement with the differential of a motor vehicle, means for elevating the coupler frame while maintaining it substantially horizontal, said elevating means including toggle lever mechanism, an electric motor for operating said toggle lever mechanism, and a spring connection transferring power from the electric motor to the toggle lever mechanism.
2. A parking car comprising a body frame, coupling means carried by the body frame, lever mechanism for elevating said coupling means, power means for moving the lever mechanism, a lost-motion connection interposed between the

power means and the coupling means, and means normally taking up the lost-motion.

3. A parking car comprising a body frame, coupling means carried by the body frame, lever
5 mechanism for elevating said coupling means, power means for moving the lever mechanism, a lost-motion connection interposed between the power means and the coupling means, and spring means normally taking up the lost-motion.

10 4. A parking car comprising a body frame, coupling means carried by the body frame, means for elevating the coupling means, said elevating means including toggle lever mechanism, an operating yoke, a pull rod, and a spring interposed
15 between the operating yoke and the pull rod and adapted to transmit power from the operating yoke to the pull rod.

5. An automobile parking car comprising a frame supported by four wheels, a coupling member, operating means carried by the frame for
20 moving the coupling member to form a towing engagement with a motor vehicle without lifting the wheels of the vehicle from the floor, and power means carried by the car for operating the operating means, said car being of such width and
25 height as to pass under the axles of an average motor vehicle in a direction parallel to the longitudinal axis of said vehicle.

6. An automobile parking car comprising a
30 frame supported by four wheels, a coupling member, operating means carried by the frame for moving the coupling member to form a towing engagement with a motor vehicle without lifting the wheels of the vehicle from the floor, power
35 means carried by the car for operating the operating means, and power means carried by the car for propelling the car, said car being of such width and height as to pass under the axles of an average motor vehicle in a direction parallel to
40 the longitudinal axis of said vehicle.

7. An automobile parking car comprising a main frame supported by four wheels, a coupling frame formed to engage part of a motor vehicle, operating means carried by the main frame for
45 elevating the coupling frame to form a towing engagement with a motor vehicle without lifting the wheels of the vehicle from the floor, and power means carried by the car for operating the operating means, said car being of such width and
50 height as to pass under the axles of an average motor vehicle in a direction parallel to the longitudinal axis of said vehicle.

8. An automobile parking car comprising a main frame supported by four wheels, a coupling
55 frame formed to engage part of a motor vehicle, operating means carried by the main frame for elevating the coupling frame to form a towing engagement with a motor vehicle without lifting the wheels of the vehicle from the floor, power
60 means carried by said car for operating said operating means, and power means carried by said car for propelling the car, said car being of such width and height as to pass under the axles of an average motor vehicle in a direction parallel to
65 the longitudinal axis of the vehicle.

9. A parking car comprising a body frame, elevatable coupling means carried by the body

frame, toggle lever mechanism connected to said coupling means, a pull rod connected to said toggle lever mechanism, motor-operated mechanism for moving the pull rod, and a spring associated
5 with the coupling means so as to be compressed when the coupling means is elevated into engagement with a vehicle to be towed.

10. A parking car comprising a body frame, elevatable coupling means carried by the body
10 frame, toggle lever mechanism connected to said coupling means, a pull rod connected to said toggle lever mechanism, motor-operated mechanism for moving the pull rod, and a spring associated with the coupling means so as to be compressed
15 when the coupling means is moved to lowered position.

11. A parking car comprising a body frame, elevatable coupling means carried by the body
20 frame, toggle lever mechanism connected to said coupling means, a pull rod connected to said toggle lever mechanism, motor-operated mechanism for moving the pull rod, a spring associated with the coupling means so as to be compressed when
25 the coupling means is elevated into engagement with a vehicle to be towed, and a spring associated with the coupling means so as to be compressed when the coupling means is moved to lowered position.

12. An automobile parking car comprising a frame supported by four wheels, a coupling member, operating means carried by the frame for
30 moving the coupling member to form a towing engagement with a motor vehicle without lifting all of the wheels of the vehicle from the floor, and power means carried by the car for operating
35 the operating means, said car being of such width and height as to pass under the axles of an average motor vehicle in a direction parallel to the longitudinal axis of said vehicle.

13. An automobile parking car comprising a
40 frame supported by four wheels, a coupling member, operating means carried by the frame for moving the coupling member to form a towing engagement with a motor vehicle without lifting all of the wheels of the vehicle from the floor,
45 power means carried by the car for operating the operating means, and means for resiliently pressing the coupling means against a part of the motor vehicle, said car being of such width and
50 height as to pass under the axles of an average motor vehicle in a direction parallel to the longitudinal axis of said vehicle.

14. An automobile parking car comprising a frame mounted on wheeled axles, a coupling
55 member having a plurality of cross bars parallel to the axles, operating means carried by the frame for moving the coupling member into engagement with a part of a motor vehicle to form
60 a towing engagement therewith without lifting all of the wheels of the vehicle from the floor, and power means carried by the car for operating the operating means, said car being of such width and height as to pass under the axles of
65 an average motor vehicle in a direction parallel to the longitudinal axis of said vehicle.

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