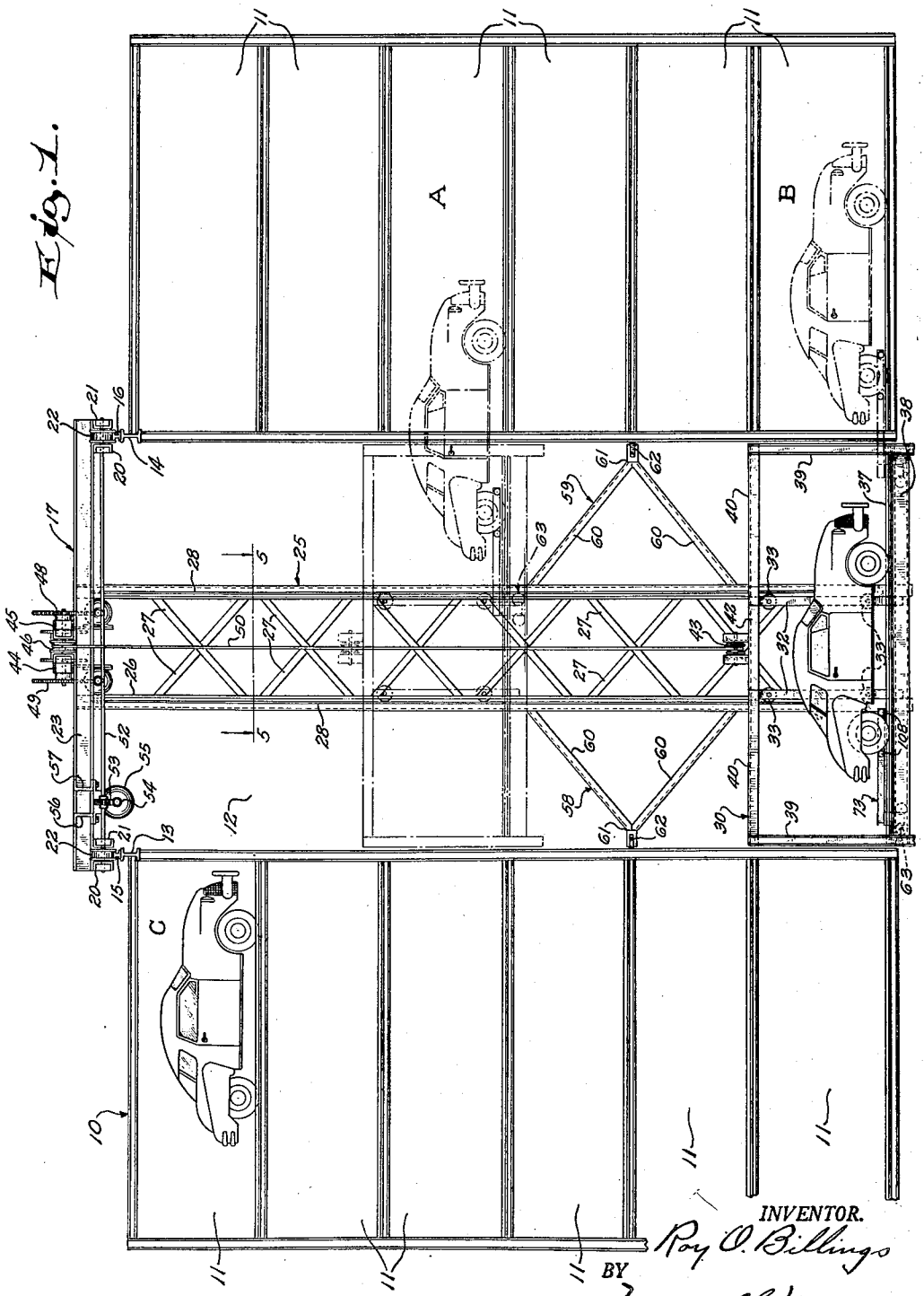
Feb. 2, 1954 R. O. BILLINGS 2,667,983

APPARATUS FOR HANDLING AUTOMOBILES

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Fig. 1.



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Fig. 2.

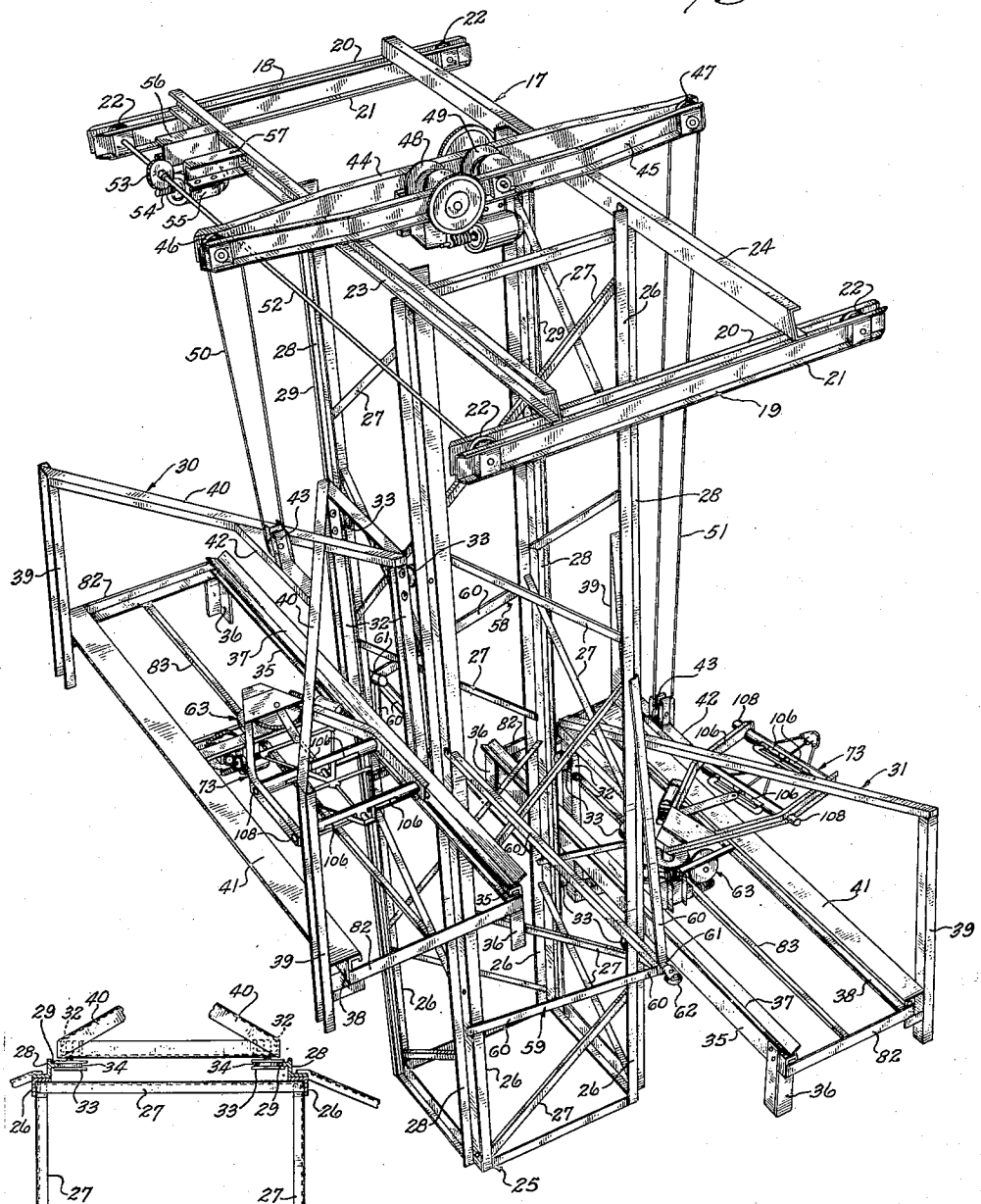


Fig. 5.

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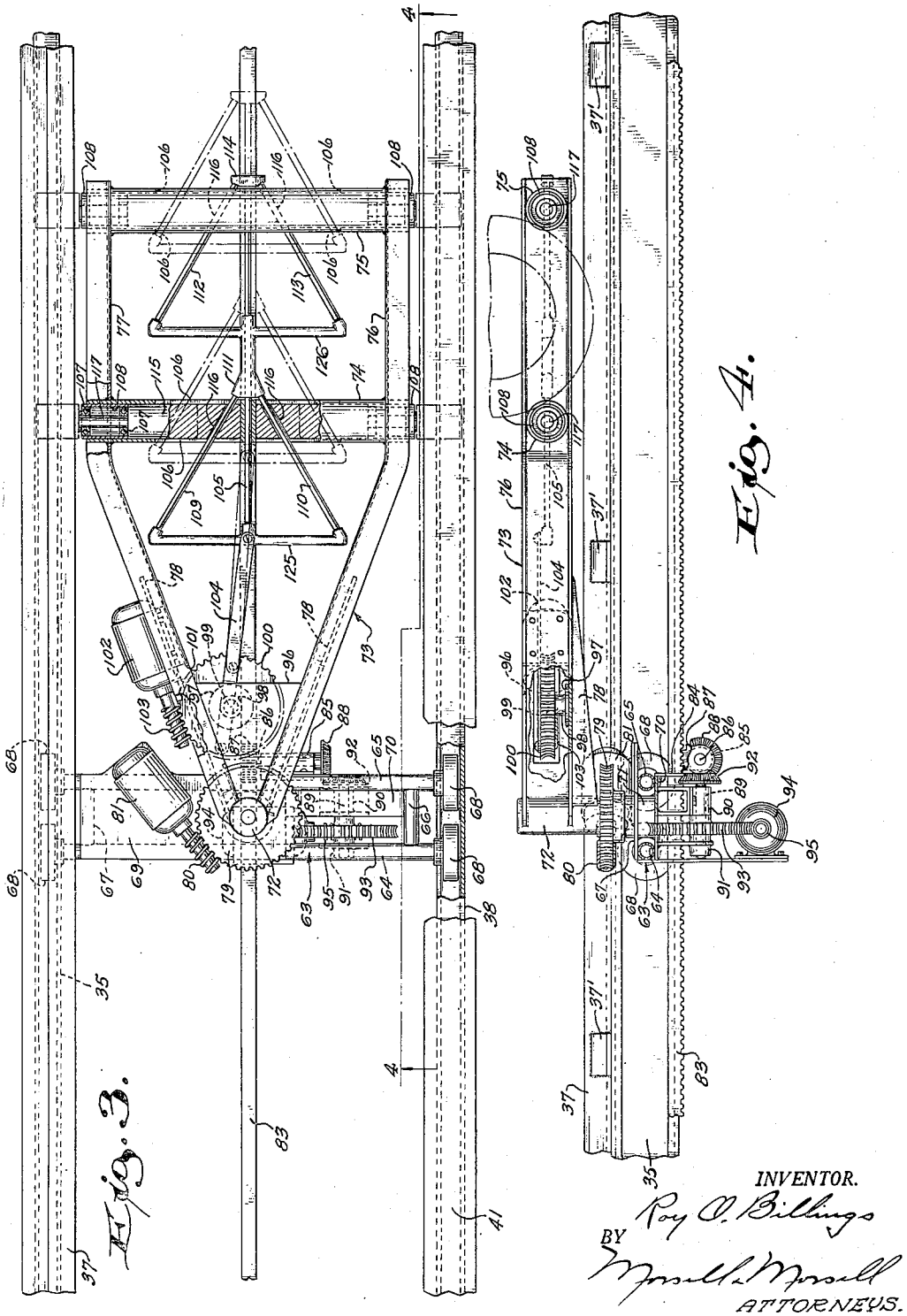


Fig. 3.

Fig. 4.

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UNITED STATES PATENT OFFICE

2,667,983

APPARATUS FOR HANDLING AUTOMOBILES

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Application October 20, 1948, Serial No. 55,603

13 Claims. (Cl. 214—95)

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This invention relates to improvements in apparatus for handling automobiles.

Automobile parking in the business districts has become a serious problem in nearly every sizable city. With the number of automobiles in use becoming greater every day, the situation is reaching a point where something must be done to provide a solution.

Many attempts have been made in the past to provide means for storing large numbers of automobiles in buildings, and for utilizing a maximum amount of the space within the buildings for actual storage purposes. While many of these attempts have provided utilization of a large percentage of space in a building for storage, none has been used to any great extent either because of impractical design or because of the extremely high cost of such installations.

It has heretofore been proposed to construct a building having a longitudinally and vertically extending passageway with storage stalls on opposite sides thereof arranged in superimposed horizontally extending rows. In the passageway it has been proposed to provide a means for elevating automobiles fron an entrance point at the ground level and for moving them longitudinally to positions in registration with selected stalls. Means have also been proposed for moving the automobiles from the elevator into said stalls and from the stalls onto the elevator.

In prior attempts the means for accomplishing the various steps in the above proposed method of parking automobiles have taken the form of a wide variety of devices. The elevating means, for example, has taken the form of a cage supported from an overhead movable carriage, and it has also taken the form of a cage supported for vertical movement within a tower which is movable longitudinally of the passageway. In many cases the construction required that an operator ride in the elevator cage. The means for moving the automobile off the elevator into the selected stall has also taken a wide variety of forms. Certain of these require the operator to drive the car off under its own power, and others have complicated and expensive mechanisms which are for the most part impractical, Other devices of this type are provided with jacks or other devices which are engageable with certain parts on the understructure of the car. With changes in automobile design many of these have become obsolete, because they do not operate properly with the late model cars.

A principal object of the invention is to provide an apparatus for handling automobiles having

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elevators, each of which is provided with a dolly which is movable longitudinally thereof, said dolly having a frame provided with tire engaging rollers, and said frame being mounted to permit its projection into the storage stalls adjacent each end of said elevator upon movement of said dolly toward one of said stalls.

A further object of the invention is to provide an apparatus of the class described wherein the frame which is provided with the tire engaging rollers is mounted on the dolly for swingable movement through an arc of approximately 180° to thereby permit its projection into a stall at either end of the elevator.

A further object of the invention is to provide an apparatus of the class described wherein the tire engaging rollers are retractable inwardly from tire engaging position to permit the swingable frame bearing said rollers to be moved into and out of operative position under an automobile.

With the above and other objects in view, the invention consists of the improved apparatus for handling automobiles, and all of its parts and combinations, as set forth in the claims, and all equivalents thereof.

In the drawing accompanying and forming a part of this specification wherein is shown one complete embodiment of the preferred form of the invention, and wherein the same reference numerals indicate the same parts in all of the views:

Fig. 1 is a side view of the improved apparatus for handling automobiles;

Fig. 2 is a perspective view on a larger scale showing the movable tower and the elevators associated therewith;

Fig. 3 is an enlarged fragmentary top view of one of the dollies showing the swingable frame mounted thereon;

Fig. 4 is a vertical sectional view taken along the line 4—4 of Fig. 3; and

Fig. 5 is a fragmentary horizontal sectional view taken along the line 5—5 of Fig. 1.

Referring more particularly to Fig. 1 of the drawing, the numeral 10 indicates a structure which has a plurality of superimposed automobile storage stalls 11 on opposite sides of a central passageway 12, the latter extending longitudinally and vertically with respect to the structure 10. The stalls 11 are preferably arranged in rows which extend in the same horizontal plane, there being several of such horizontal rows of stalls superimposed upon one another. The structure 10 may take the form of a building in

which the horizontal rows of stalls are located on respective floors of said building, but it preferably takes the form shown, namely that of an open framework.

Mounted at the upper end of the passageway 12, and extending longitudinally along each side thereof, are a pair of spaced parallel horizontally extending I beams 13 and 14. The beams 13 and 14 support a pair of tracks 15 and 16 which are fixed to the upper surface thereof.

The numeral 17 indicates a tower assembly which is supported for longitudinal movement on the rails 15 and 16. Referring to Fig. 2, the tower assembly 17 may consist of a pair of longitudinally extending truck members 18 and 19, each of which is formed of a pair of channel members 20 and 21, and at each end of which is journalled a wheel 22 preferably having a grooved periphery. The wheels 22 travel on the upper surfaces of the rails 15 and 16. Extending transversely of and supported on the truck members 18 and 19 are a pair of spaced transverse supporting members 23 and 24.

Depending downwardly from the supporting members 23 and 24 is an elongated rectangular cage or tower member 25. The tower 25 may be constructed of suitable metal shapes such as the elongated vertically extending angle members 26 positioned in each corner thereof and having suitable angularly disposed members 27 extending therebetween to form a structure which is rectangular in cross-section, as shown in Fig. 5.

On opposite sides of the tower member 25 a pair of vertical angle guide members 28 are fixed to the angle members 26 and extend longitudinally thereof as shown in Figs. 2 and 5. The guide members 28 are each formed with a longitudinally extending flange or rail 29 which projects from the inner face thereof. The flanges 29 of the guide members 28 on one side of the tower 25 project toward each other as shown in Fig. 5. Mounted for vertical movement at the sides of the tower 17 and adjacent the guide members 28 are a pair of elevators 30 and 31.

The elevators 30 and 31 are substantially identical, and each comprises a pair of spaced vertically extending channel members 32, at the upper and lower ends of which are journalled wheels 33. The wheels 33 are each formed with a peripheral groove 34. The lower ends of the members 32 of each elevator are fixedly connected, through suitable brackets, to a horizontally extending channel member 35 which is C-shaped in cross section. Each end of each channel 35 is provided with a depending relatively short leg 36, and fixed to the upper surface of the members 35, as by the brackets 37' (see Fig. 4), is a V-shaped angle member 37. A second channel member 38 is positioned outwardly of each of the channels 35, parallel therewith and in the same horizontal plane. The channels 38 are also C-shaped in cross section, and it will be noted that the open faces of the channels 35 and 38 of each elevator face one another. The channels 38 are suported at each end by suitable brackets which fixedly connect them to a pair of vertically extending channel members 39. The lower ends of the channels 39 are positioned in the same horizontal plane as the lower ends of the legs 36, and the upper ends of the members 39 extend to the same horizontal plane as the upper ends of the channels 32.

A pair of crossed beams 40 rigidly connect the upper ends of the channels 32 with the upper ends of the channels 39, as shown in Fig. 2. An elongated plate 41 is fixed to the upper surface of the channels 38 as shown, and a short beam 42 extends parallel with the channels 38 and connects intermediate portions of the beams 40. A suitable pulley 43 is connected to the upper surface of each of the beams 42.

A pair of spaced channel members 44 and 45 are fixedly mounted on the supporting beams 23 and 24 and extend transversely thereof. The channels 44 and 45 project beyond the members 23 and 24 and converge toward one another at each end. Journalled in said ends are pulleys 46 and 47. Mounted on the channels 44 and 45 intermediate the length thereof are a pair of electrically powered hoisting winches 48 and 49. A hoisting cable 50 is fixed at one end adjacent the pulley 46 and extends downwardly around the pulley 43 therebelow, upwardly over the pulley 46 and inwardly to the drum of the winch 48 around which the remainder thereof is wound. A second cable 51 has one end fixed adjacent the pulley 47 and extends downwardly around the pulley 43 therebelow, upwardly over the pulley 47 and inwardly to the drum of the winch 49 around which the remainder thereof is wound.

It is apparent that by operation of the electric winches 48 and 49 the elevators 30 and 31 can be raised or lowered as desired, each independently of the other. By reason of the coaction of the wheels 33 with the guide members 28 the movement of the elevators 30 and 31 is limited to vertical rectilinear movement, and tilting or swaying thereof is prevented regardless of the size or position of the load thereon.

At the top of the tower a shaft 52 is fixed to and extends between a pair of the wheels 22. Fixedly mounted on the shaft 52 is a worm wheel 53 which coacts with a worm 54 fixed on the shaft of a reversible electric motor 55. The motor 55 is mounted on the supporting member 23 through suitable brackets such as those shown at 56 and 57. Operation of the motor 55 causes rotation of the wheels 22 fixed to the shaft 52, and this, in turn, causes movement of the entire tower assembly 17 longitudinally of the passageway 12. The tower 25, during said longitudinal movement, is prevented from swaying transversely by a pair of struts 58 and 59 mounted on opposite sides thereof. The struts 58 and 59 are each formed of four outwardly projecting legs 60 which converge to an apex 61, at which point a roller 62 is mounted for rotation in a horizontal plane. The roller 62 rollingly engages the surface of a suitable plate (not shown) which extends longitudinally of the passageway 12 at each side thereof.

Referring to Fig. 2, it will be noted that each of the elevators 30 and 31 is provided with a dolly 63 which is mounted for movement longitudinally thereof.

Referring to Figs. 3 and 4, the dolly 63 has a frame which may be made of a pair of parallel tubular members 64 and 65 which are connected adjacent each end by relatively short tubular members 66 and 67 at right angles thereto. Rotatably mounted at each end of the frame members 64 and 65 and positioned within the adjacent channel members 35 and 38 are wheels 68. The wheels 68 have a diameter which is slightly less than but substantially equal to the height of the interior of the channels 35 and 38, so that said rollers can rollingly engage either the upper interior or the lower interior surface of said channels with a minimum of vertical movement.

A plate member 69 is fixed to the top of the frame members 64 and 65 and extends from adja-

cent the inner end thereof to past the mid point thereof as shown in Fig. 3. A second plate member 70 is secured to the under side of the frame members 64 and 65 and extends from adjacent one end to adjacent the other end thereof. A bearing 71 which is rigidly supported by the plates 69 and 70 provides a rotatable mounting for a vertically extending relatively short shaft 72 which has a relatively large diameter.

A swingable frame 73 is rigidly connected to the upper end of the shaft 72 and at a right angle to the axis thereof. The frame 73 consists of a pair of parallel tubular members 74 and 75 which are rigidly connected adjacent each end by a pair of parallel channel members 76 and 77. The channels 76 and 77 extend beyond the tubular members 74 and converge toward the shaft 72, to which they are fixedly connected. A supporting web 78 preferably reinforces each of the channels 76 and 77 adjacent the shaft 72.

Fixed to the shaft 72 above the bearing 71 and below the frame 73 is a worm wheel 79. A worm 81 meshes with the worm wheel 79 and is driven by a reversible electric motor 81 which is mounted on the plate 69. Operation of the motor 81 causes rotation of the shaft 72 and causes swinging movement of the frame 73 about the axis of said shaft.

Referring to Fig. 2, it will be noted that an angle member 82 connects the ends of the channel members 35 and 38 of each elevator. Extending longitudinally of each elevator and supported at each end by an intermediate portion of an angle member 82 is a rack member 83 having gear teeth formed on the under side thereof as shown in Fig. 4. Referring again to Figs. 3 and 4, a suitable bracket, such as the plate 84, depends from an edge portion of the plate 70 adjacent the frame member 65 and supports a bearing 85 in which is rotatably mounted a short transverse shaft 86. Fixed to one end of the shaft 86 is a pinion 87 which meshes with the rack 83, and fixed to the opposite end of said shaft is a bevel gear 88.

A longitudinally extending short shaft 89 is preferably journalled in bearings 90 and 91 which are suspended from the plate 70 in any suitable manner. The shaft 89 is positioned in the same horizontal plane as the shaft 86. At one end of the shaft 89 is fixed a bevel gear 92 which meshes with the bevel gear 88. Between the bearings 90 and 91 a worm wheel 93 is fixedly mounted. The plate 70 is apertured adjacent the upper portion of the worm wheel 93 to permit said wheel to project thereabove. A reversible electric motor 94 is suitably suspended from the edges of the plates 69 and 70 and from the frame member 64 as shown, and said motor drives a worm 95 which meshes with the worm wheel 93. It is apparent that operation of the motor 94 causes rotation of the pinion 87, which, in turn, causes movement of the dolly 63 longitudinally of the channels 35 and 38.

A pair of substantially triangular gusset plates 96 and 97 connect the channels 76 and 77 adjacent their upper and lower surfaces and adjacent the shaft 72. Mounted on the lower gusset plate 97 is a bearing 98 in which is journalled a vertically extending short shaft 99. Fixed to the upper end of the shaft 99, and between the plates 96 and 97, is a worm wheel 100. The web of the channel 77 is slotted as at 101 to permit the worm wheel 100 to project therethrough as shown in Figs. 3 and 4. Mounted on the outer side of the channel 77 adjacent the slot 101 is an electric motor 102 which drives a worm 103, the latter meshing with the worm wheel 100.

Pivotally connected to a peripheral portion of the upper surface of the worm wheel 100 is one end of a link 104. The opposite end of the link 104 is pivotally connected to a shaft 105 which extends longitudinally through suitable bearings in the tubular frame members 74 and 75. The tubular members 74 and 75 are formed with slots 106 on opposite sides of the shaft 105, said slots extending in the same horizontal plane as the shaft 105, as shown in Figs. 2, 3 and 4. A pair of spaced transverse bars 125 and 126 are fixed to the shaft 105 on opposite sides of the tubular member 74. A pair of rod members 109 and 110 are rigidly connected at one end to the outer ends of the transverse bar 125 and extend through the slots 106 of the tubular member 74. The rods 109 and 110 converge and are rigidly connected to the shaft 105 as at 111. A pair of rods 112 and 113 are similarly connected to the bar 126 and convergingly extend through the slots 106 of the tubular member 75 to a point 114 where they are fixed to the shaft 105.

Slidably positioned within each of the tubular frame members 74 and 75, and on each side of the shaft 105, are enlarged shafts 115, the outside diameter of which is substantially equal to the inside diameter of the frame members 74 and 75. Each of the shafts 115 at its inner end is formed with an angled aperture 116 through which one of the rods 109, 110, 112 or 113 slidably extends as shown in Fig. 3. The outer ends of the shafts 115 are formed with portions of reduced diameter 117 at each end of which is mounted a set of ball bearings 107 which rotatably support a sleeve roller 108. The sleeve rollers 108 have an outside diameter substantially equal to that of the shafts 115.

It is apparent that operation of the motor 102 causes rotation of the worm wheel 100, which, in turn, causes axial reciprocation of the shaft 105. As the shaft 105 moves longitudinally, the rods 109, 110, 112 and 113 move rectilinearly therewith. As the rods 109, 110, 112 and 113 so move, the shafts 115 are caused to move transversely by reason of the coaction of said rods with the apertures 116 therein. For example, when the shaft 105 moves toward the right in Fig. 3 to the dot and dash positions therein, the shafts 115 are at the same time moved transversely outwardly to the dot and dash positions in which they are shown. Conversely, when the shaft 105 is again moved toward the left, as viewed in Fig. 3, the shafts 115 will be retracted from the dot and dash line positions to the full line positions thereof.

The improved apparatus may be constructed so that the street level coincides with any one of the storage stall levels shown in Fig. 1. For the purposes of explanation in this specification it will be assumed that the lower left hand stall 11, shown in Fig. 1, and stalls adjacent thereto in the same row, provide an entrance into the improved apparatus. The stalls 11 on the opposite side of the passageway 12 therefrom may lead to an exit for automobiles leaving the apparatus.

Since the operation of both of the elevators 30 and 31 is identical, though independent, and since only the elevator 30 appears in Fig. 1, the operation of that elevator will be described hereinafter.

Prior to running an automobile onto the elevator 30 from the entrance, the dolly 63 is prefer-

ably moved adjacent the end of the elevator which is farthest from the stall in which the automobile is to be stored. Movement of the dolly is accomplished, as previously described, by operation of the motor 94. The frame 73 on the dolly 63 is swung toward a central portion on the elevator with the shaft 105 thereof, preferably substantially parallel with the channels 35 and 38, is clearly shown in Figs. 1 and 3. As also shown in Fig. 3, the shafts 115 and the rollers 108 thereon are in retracted position.

An automobile may now be driven onto the elevator 30 from the entrance. As the automobile is driven onto said elevator, the wheels thereof which are nearest the tower 25 travel along the V-shaped angle member 37, and the wheels on the opposite side of the automobile travel along the plate 41. The angle member 37 guides the automobile, while the plate 41, being flat, permits cars having wheelbases of various widths to be carried by the same elevator. In addition, the plate 41 is sufficiently wide and is so positioned that it provides a platform on which the driver can walk upon alighting from the automobile.

The automobile is preferably driven onto the elevator 30 until it is substantially centered thereon as shown in Fig. 1. The dolly 63 is then moved, if necessary, to position the rollers 108 of the frame 73, one forwardly and one rearwardly of the periphery of the adjacent tires of the automobile but offset inwardly therefrom. By operation of the motor 102, the shaft 105 is reciprocated to the right, as viewed in Fig. 3, to thereby cause the shafts 115 and the rollers 108 to move outwardly as previously described. This places the rollers 108 directly forwardly and rearwardly of the tread surface of said tires.

Assuming that it is desired to store the automobile in a stall on the fourth level and on the right hand side of the passageway as viewed in Fig. 1, and as indicated by the letter A, the elevator 30 is raised, by means of the winch 48 until it registers with the desired level. The tower assembly 17 is then moved longitudinally, if necessary, to cause the elevator 30 to register with the desired stall on the fourth level. Longitudinal movement of the tower 17 is effected, as previously described, by operation of the motor 55.

When the elevator 30 has been brought into registration with the stall "A," the dolly is moved toward said stall. Movement of the dolly 63 causes engagement of the rollers 108 with the adjacent automobile tires, and causes the rollers at the rear of said tires to push forwardly on said tires. This causes the automobile to roll forwardly toward the stall "A" as shown by the dot and dash lines of Fig. 1. The automobile is pushed into the stall A until the dolly 63 has reached the limit of its travel in the channels 35 and 38. This position is that shown in dot and dash lines at "B" in Fig. 1. It will be noted that in this position the frame 73 projects into the storage stall a considerable distance. After the automobile is placed in stored position in the desired stall, the motor 102 on the dolly 63 is operated to retract the rollers 108 from their positions of engagement with the automobile tires. This permits the dolly 63 to be moved, by operation of the motor 94 in a reverse direction along the elevator 30, said movement being effective to retract the frame 73 from the storage stall.

To remove an automobile from stored position in a stall, the operation is substantially the reverse of that storing said automobile. To do this the elevator 30 is moved vertically, and the tower is moved longitudinally, if necessary, until the elevator 30 registers with the stall in which the automobile is stored. The frame 73 is then projected into the stall, and the rollers 108 are extended into engagement with the adjacent tires of the automobile, as shown, for example, at "B" in Fig. 1, and as described hereinbefore. Movement of the dolly 63 toward the opposite end of the elevator 30 pulls the automobile onto the elevator with a rolling movement. After the automobile has been pulled onto the elevator, the elevator can be lowered, and the tower 17 moved longitudinally if necessary, to bring the elevator into registration with a stall which leads to the exit. The rollers 108 are then retracted, and the car can then be driven off the elevator and onto the street.

By reason of the swingable mounting for the frame 73, cars can with equal ease be stored in and removed from stalls on both sides of the passageway 12. For example, to remove an automobile from the position "C" on the sixth level, the frame 73 would be swung 180° from its position shown in Figs. 1 and 3, and the rollers 108 would engage the front tires of said automobile. The operation is substantially the same regardless of whether the rollers 108 engage the front tires of an automobile or the rear tires thereof.

Referring to Fig. 2, the frame 73 on the dolly of the elevator 31 is shown being swung from one position to another. It will also be noted in this figure that the rollers 108 on the frame 73 of the elevator 31 are in projected position, and that the rollers 108 on the frame 73 of the elevator 30 are in retracted position. This is for the purpose of illustration. Normally the rollers 108 are in retracted position when not actually in engagement with the tires of an automobile.

It is contemplated that the entire apparatus be operated by remote control from a central station, and any suitable electrical circuit may be used to control the operation of the motors which drive the various parts of the apparatus.

Engagement of the frame 73 with the automobiles moved thereby is accomplished exclusively by rolling contact of the rollers 108 with the tires of said automobile. For this reason the apparatus is adapted to handle any wheeled vehicle. In addition, there is no necessity for employing clamps, jacks or other similar expedients for engaging and moving said automobile. There is no need for an operator either to ride the elevator or to drive automobiles into or out of the storage stalls. Once the automobile has been driven onto the elevator from the entrance it need not again be entered for driving purposes until it is returned to the exit level to be driven away by its owner.

Various changes and modifications may be made without departing from the spirit of the invention, and all of such changes are contemplated, as may come within the scope of the claims.

What I claim is:

1. A wheeled dolly for use in an apparatus for handling automobiles comprising: an elongated swingable frame mounted at one end on said dolly for swinging movement in a horizontal plane, said frame being formed with a pair of spaced parallel transversely extending open ended sleeves; automobile engaging means normally positioned in said sleeves and movable axially outwardly to positions in which they project beyond a side of said frame; cam means on said

swingable frame mounted for reciprocating movement longitudinally of said frame and positioned to cause simultaneous lateral movement of all of said rollers; an electric motor on said swinging frame; and an eccentric driven by said motor and connected to said cam member to cause reciprocating movement of the latter when said eccentric is rotated.

2. In a wheeled dolly for use in an apparatus for handling automobiles: an elongated swingable frame mounted at one of its ends on said dolly for swinging movement in a horizontal plane; an axially movable transversely extending roller supporting member mounted on said frame, said member being formed with an oblique cam surface; a roller carried at one end of said member and normally in retracted position in said frame, said roller being movable outwardly of said frame to a projecting position; a cam member mounted on said frame for movement longitudinally thereof, said cam member including an oblique rod positioned in sliding engagement with the oblique cam surface of said transverse member, whereby longitudinal movement of said cam member in one direction causes axial movement of said roller from its normal retracted position to a projecting position.

3. In a wheeled dolly for use in an apparatus for handling automobiles: an elongated swingable frame mounted at one of its ends on said dolly for swinging movement in a horizontal plane; an axially movable transversely extending shaft mounted on said frame, said shaft being formed with an oblique aperture therethrough; a roller carried at one end of said shaft and normally in retracted position in said frame, said roller being movable outwardly of said frame to a projecting position; a cam member mounted on said frame for movement longitudinally thereof, said cam member including an oblique rod slidably positioned in the oblique aperture of said transverse shaft, whereby longitudinal movement of said cam member in one direction causes axial movement of said roller from its normal retracted position to a projecting position.

4. In a wheeled dolly for use in an apparatus for handling automobiles: an elongated swingable frame mounted at one of its ends on said dolly for swinging movement in a horizontal plane; a slotted transversely extending open ended sleeve carried by said frame; an axially movable shaft positioned in said sleeve, said shaft being formed with an oblique cam surface; a roller carried at one end of said shaft and normally in retracted position in said sleeve, said roller being movable outwardly of said sleeve to a projecting position; a cam member mounted on said frame for movement longitudinally thereof, said cam member including an oblique rod extending through the slots of said sleeve and positioned in sliding engagement with the oblique cam surface of said shaft, whereby longitudinal movement of said cam member in one direction causes axial movement of said roller from its normal retracted position to a projecting position.

5. In a wheeled dolly for use in an apparatus for handling automobiles: an elongated swingable frame mounted at one of its ends on said dolly for swinging movement in a horizontal plane; a slotted transversely extending open ended sleeve carried by said frame; an axially movable shaft positioned in said sleeve, said shaft being formed with an oblique aperture therethrough; a roller carried at one end of said shaft and normally in retracted position in said sleeve, said roller being movable outwardly of said sleeve to a projecting position; a cam member mounted on said frame for movement longitudinally thereof, said cam member including an oblique rod extending through the slots of said sleeve and slidably positioned in the oblique aperture of said shaft, whereby movement of said cam member in one direction longitudinally of said frame causes axial movement of said roller from its normal retracted position to a projecting position.

6. In a wheeled dolly for use in an apparatus for handling automobiles: an elongated swingable frame mounted at one of its ends on said dolly for swinging movement in a horizontal plane; a slotted transversely extending open ended sleeve carried by said frame; a pair of axially movable shafts positioned in said sleeve, said shafts each being formed with an oblique aperture therethrough; a roller carried at an end of each of said shafts adjacent the ends of said sleeve, said rollers being normally in retracted position in said sleeve, and said rollers being movable in opposite directions outwardly of said sleeve to projecting positions; a cam member mounted on said frame for movement longitudinally thereof, said cam member including a pair of oblique rods extending through the slots of said sleeve and each slidably positioned in the oblique aperture of one of said shafts, whereby movement of said cam member in one direction longitudinally of said frame causes axial movement of said rollers from their normal retracted positions to projecting positions.

7. In a wheeled dolly for use in an apparatus for handling automobiles: an elongated swingable frame mounted at one of its ends on said dolly for swinging movement in a horizontal plane; a pair of spaced transversely extending slotted open ended sleeves carried by said frame; a pair of axially movable shafts positioned in each of said sleeves, said shafts each being formed with an oblique aperture therethrough; a roller carried at an end of each of said shafts adjacent the ends of said sleeves, said rollers being normally in retracted position within said sleeves, and said roller being movable outwardly of said sleeves to projecting positions; a pair of interconnected cam members mounted on said frame for movement longitudinally thereof, said cam members each including a pair of oblique rods extending through the slots of one of said sleeves and each rod extending slidably through the oblque aperture of one of the shafts in said sleeve, whereby movement of said cam members in one direction longitudinally of said frame causes simultaneous axial movement of all of said rollers from their normal retracted positions to projecting positions.

8. A wheeled dolly for use in an apparatus for handling automobiles comprising a relatively short wheeled frame an elongated swingable frame mounted at one end of said wheeled frame for swinging movement in a horizontal plane, said frame being of a length to always project a substantial distance beyond said wheeled frame laterally movable means at the opposite end of said frame and a substantial distance beyond the wheels of said wheeled frame for effecting a draft engagement with an automobile, cam means on said swingable frame mounted for a reciprocating movement longitudinally of said frame and positioned to cause lateral movement of said laterally movable means, an electric motor on said swinging frame, and mechanism driven by said motor and connected to said cam means to cause reciprocating movement of the latter.

9. An apparatus for handling automobiles comprising an elevator, a dolly permanently mounted on said elevator for movement toward either end thereof; a cantilever frame pivotally mounted on said dolly for swinging movement, said frame being of substantially greater length than said dolly to always project a substantial distance therebeyond releasable means on said frame near the outermost portion thereof and a substantial distance beyond said dolly for effecting a draft engagement of said frame with an automobile, said frame being of a length to project in a selected direction beyond either end of said elevator to cause positioning of the same releasable means beyond either end of the elevator while the dolly is still on the elevator, and means on the dolly for causing swinging movement of the frame.

10. An apparatus for handling automobiles comprising an elevator, a dolly permanently mounted on said elevator for movement toward either end thereof; a cantilever frame pivotally mounted on said dolly for swinging movement, said frame being of substantially greater length than said dolly to always project a substantial distance therebeyond releasable means on said frame near the outermost portion thereof and a substantial distance beyond said dolly for effecting a draft engagement of said frame with an automobile, said frame being of a length to project in a selected direction beyond either end of said elevator to cause positioning of the same, releasable means beyond either end of the elevator while the dolly is still on the elevator, said frame being in overbalanced relationship with respect to said dolly, and means between said dolly and elevator for bracing the dolly during swinging movement of said overbalanced frame and for bracing the dolly when the frame is projecting beyond an end of the elevator.

11. An apparatus for handling automobiles comprising an elevator, a dolly permanently mounted on said elevator for movement toward either end thereof; a cantilever frame pivotally mounted on said dolly for swinging movement, said frame being of substantially greater length than said dolly to always project a substantial distance therebeyond releasable means on said frame near the outermost portion thereof and a substantial distance beyond said dolly for effecting a draft engagement of said frame with an automobile, said frame being of a length to project in a selected direction beyond either end of said elevator to cause positioning of the same releasable means beyond either end of the elevator while the dolly is still on the elevator, and means between said dolly and elevator for bracing the dolly during swinging movement of said frame and for bracing the dolly when the frame is projecting beyond an end of the elevator.

12. In combination: an elevator having open ends and having an open side, a relative short wheeled dolly mounted on said elevator for movement toward and away from said open ends, and

a frame swingably mounted on said dolly, said frame having automobile engaging means on an outer portion and having a length so that said outer portion normally projects a substantial distance beyond the wheels of the dolly and a substantial distance beyond the side of the elevator when the frame is swung to a position transversely of said elevator, the open side of said elevator permitting unobstructed swinging movement of the frame through an arc of approximately 180° outwardly of its axis of swinging movement whereby the automobile engaging means on said frame may be selectively swung toward either end of the elevator and whereby the automobile engaging means may be caused to project a substantial distance beyond either end of the elevator while the dolly is still on the elevator and when it is moved close to said end.

13. In combination: an elevator having open ends and having an open side, a relative short wheeled dolly mounted on said elevator for movement toward and away from said open ends, and a frame horizontally swingably mounted on said dolly, said frame having automobile engaging means on an outer portion and having a length so that said outer portion normally projects a substantial distance beyond the wheels of the dolly and a substantial distance beyond the side of the elevator when the frame is swung to a position transversely of said elevator, the open side of said elevator permitting unobstructed swinging movement of the frame through a horizontal arc of approximately 180° outwardly of its axis of swinging movement whereby the automobile engaging means on said frame may be selectively swung toward either end of the elevator and whereby the automobile engaging means may be caused to project a substantial distance beyond either end of the elevator while the dolly is still on the elevator and when it is moved close to said end.

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