Oct. 9, 1956

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2,765,932

VEHICLE PARKING DEVICE

Filed Jan. 9, 1956

4 Sheets-Sheet 1

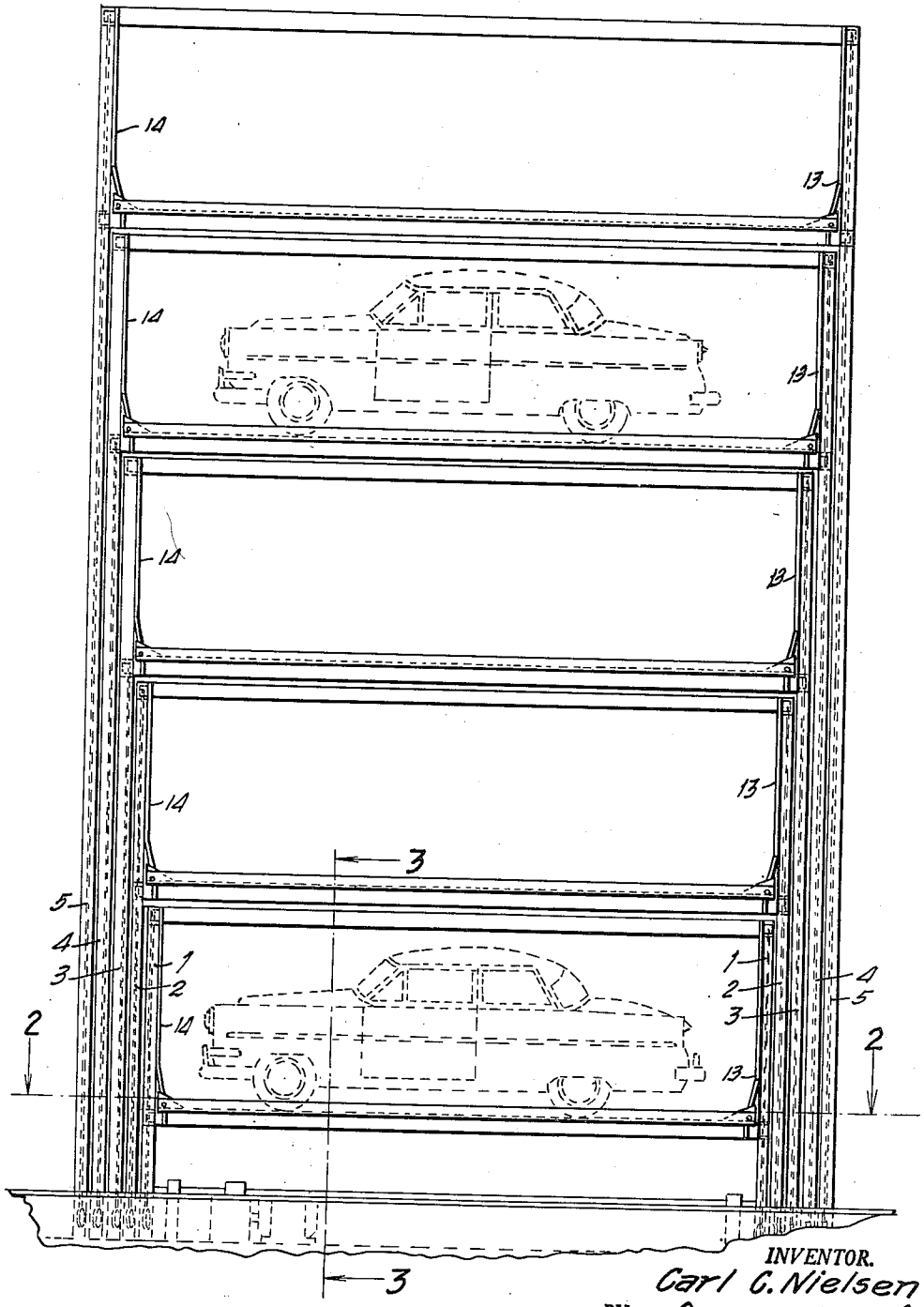


FIG. 1

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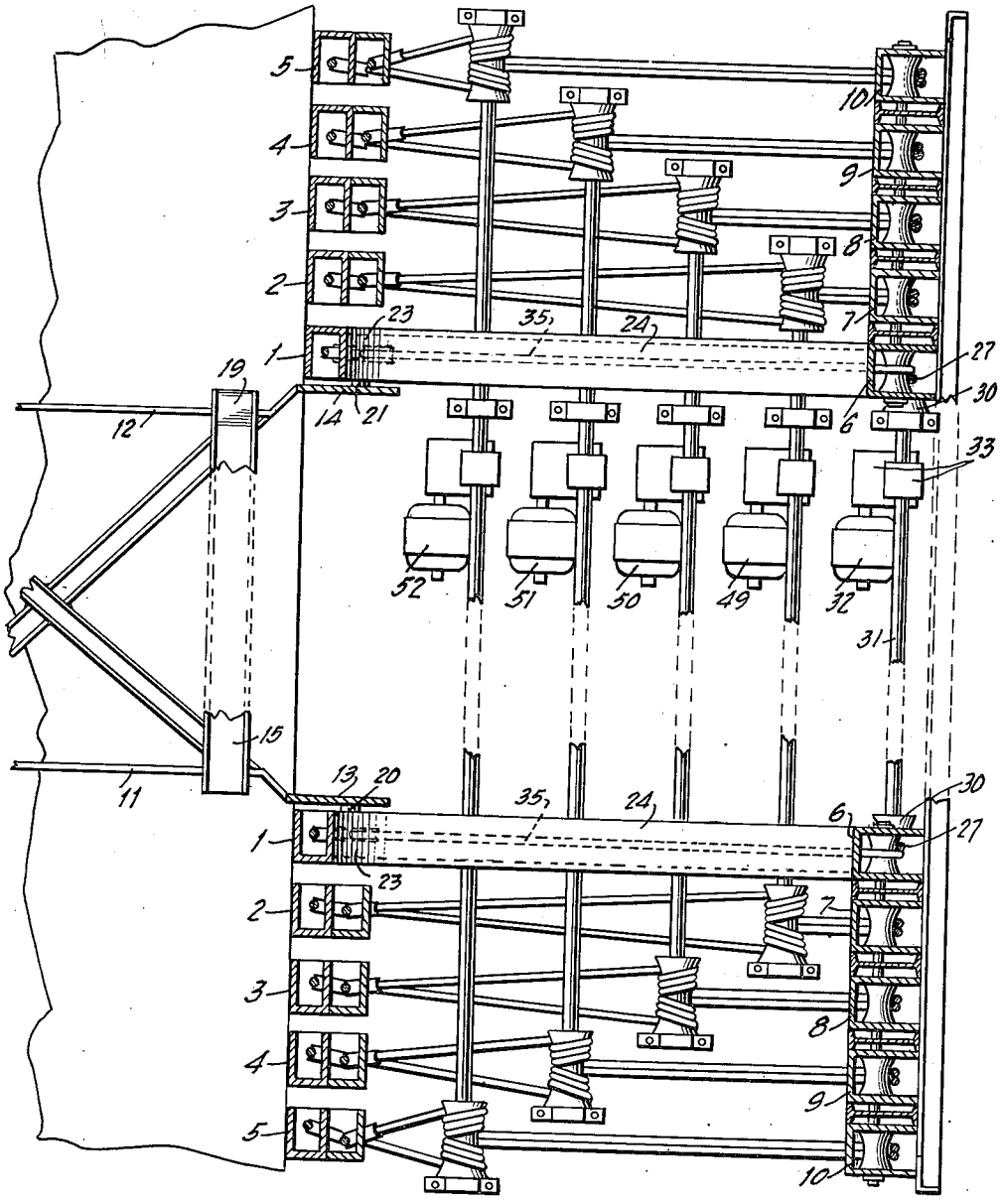


FIG. 2

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4 Sheets-Sheet 3

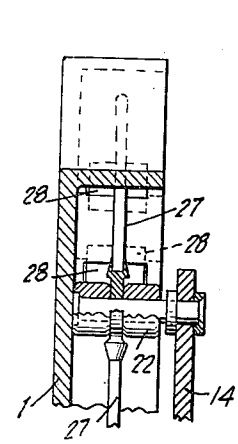


FIG. 4

FIG. 3

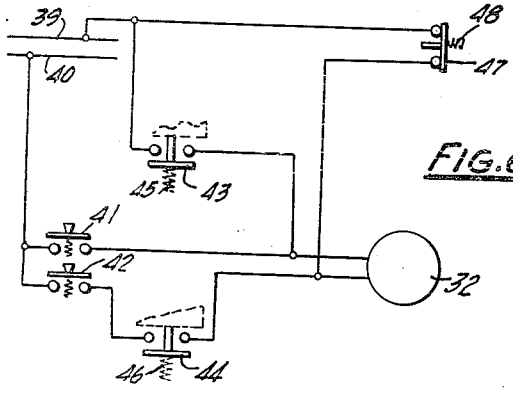


FIG. 6

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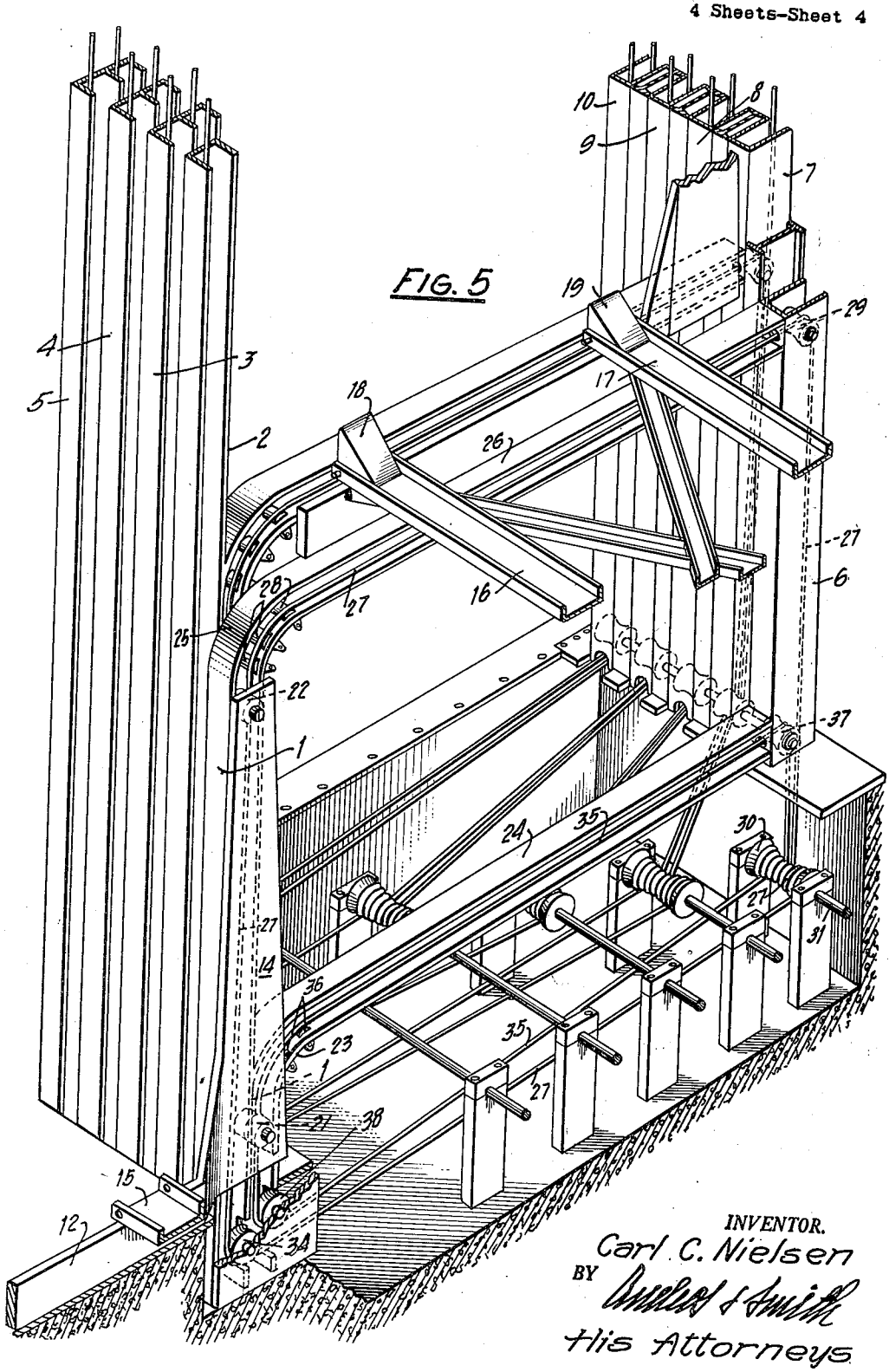
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4 Sheets-Sheet 4

FIG. 5



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2,765,932

VEHICLE PARKING DEVICE

Carl C. Nielsen, Schenectady, N. Y.

Application January 9, 1956, Serial No. 558,131

9 Claims. (Cl. 214—16.1)

My invention relates to vehicle parking structures which are provided with elevators for conveying vehicles to and from their parking places in the structure.

One of the objects of my invention is to provide a parking structure in which spaces for parking vehicles are disposed one above the other and in which each parking space is provided with its individual elevator for conveying vehicles to and from said space. Another object is to provide a device of this character which is push-button operated and which is substantially safe and foolproof in its operation.

I accomplish these objects by the means described below and illustrated in the accompanying drawings in which—

Fig. 1 is a front elevation view of a five story structure embodying my invention;

Fig. 2 is a section of Fig. 1 in the plane 2—2;

Fig. 3 is a section of Fig. 1 in the plane 3—3;

Fig. 4 is a section of Fig. 3 in the plane 4—4, drawn to a somewhat enlarged scale;

Fig. 5 is a view similar to Fig. 3 but in perspective; and

Fig. 6 is a wiring diagram.

Referring first to Figs. 1 and 2, my device comprises a series of upright channel members 1, 2, 3, 4 and 5 which support the front of the structure, and all of which are disposed in closely spaced parallel relation but arranged in two horizontally spaced groups. Although illustrated as integral structures, each of said members, in practice, would be formed of two separate channels secured together by bolts, welding or otherwise, because they must be bent separately at vertically spaced points, as explained below. The two channels 1 may be said to support the first floor parking space at the front thereof and are separated a distance sufficient to pass a vehicle to be parked when it is moved sidewise therebetween. The channels 2, 3, 4 and 5, respectively, form the supports at the front for the second, third, fourth and fifth parking spaces.

At the rear, the structure is supported by I-beams and channels 6, 7, 8, 9 and 10 which are arranged in two spaced groups like the channels at the front of the structure. The two channels 1, at the front, and the two channels 6, at the rear, support the first parking space, and the channels 2 and 7 support the second parking space, etc.

While I have illustrated only one elevator, it is to be understood that each parking place has its own elevator. These elevators except for length are substantially identical or, at least identical in the way they operate. Thus, referring first to Figs. 2 and 5, each elevator comprises two horizontal beams, such as shown at 11 and 12, each of which has an upstanding portion, shown at 13 and 14 in Fig. 2, which are closely adjacent and between the front channels which support the parking space for the elevator. The beams 11 and 12 serve to support two channels, one of which is shown at 15 in Figs. 2, 3 and 5, and which are spaced to allow a motor vehicle to be

driven thereon. The channels on the elevator for the second parking space, and which is in said space, are shown at 16 and 17 in Fig. 5 and also in Fig. 3. In order to prevent a vehicle from overrunning the ends of the channels, blocks 18 and 19 are provided therein as best shown in Fig. 5.

The upstanding portions 13 and 14 are provided, adjacent the bottom thereof, with rollers 20 and 21 (see Figs. 2, 3 and 5) which are pivotally connected thereto in coaxial relation to each other and which extend into the rear channels in the channels 1. The members 13 and 14 are also provided adjacent the top with rollers, such as shown at 22 in Figs. 3, 4 and 5, which are pivotally connected thereto in coaxial relation and extend into the front channels in the channels 1. The rear channels in the channels 1 are bent smoothly, as shown at 23, and extend horizontally to the rear of the parking space as best shown at 24 in Figs. 2, 3 and 5 and the front channels in the channels 1 are bent smoothly, as shown at 25 in Figs. 3 and 5, into the horizontal portions 26.

Each of the rollers 22 has both ends of one of the cables 27 secured thereto which ride on rollers 28 pivotally mounted at the bends 25 and which extend through the bottom portion of each of the members 26, as best shown in Fig. 5. The cables 27 ride within the horizontal portions of the channels 26 and extend over pulleys 29, thence downwardly and several times around pulleys 30 on shaft 31 which is driven by a reversible motor 32 through speed-reducing gears 33; thence around pulleys 34 at the bottom of the channel 1, as shown in Figs. 3 and 5; and thence upwardly to the rollers 22.

Secured to each of the rollers 21 which are secured to the upstanding members 13 and 14 adjacent the bottoms thereof is one of the ends of a cable 35. The cables 35 run around the rollers 36 similar to the rollers 28; thence within the horizontal portions 24 of the rear channels of channel 1; around the pulleys 37; thence downwardly and several times around the pulleys 30 with the cables 27, as best shown in Fig. 5; thence around pulleys 38 in the bottom of the channels 1; and thence upwardly to the rollers 21.

From the foregoing it will be apparent that the cables 27 and 35 are substantially continuous from end to end and that they are both driven by the pulleys 30 and motor 32.

Referring now to Fig. 6, 39 and 40 are the power lines; 32 is the reversible motor and 41 and 42 are manually actuated switches for starting the motor 32 to move the elevator up and down, respectively. 43 and 44 are switches which are opened by the elevator when in its lowermost position although they are normally closed by means of the springs 45 and 46 when none of the elevators is down. 47 is a safety switch, shown also in Fig. 3, which is opened by the elevator when it is substantially entirely within its parking space. When the elevator is down, however, the switch 47 is automatically closed by means of the spring 48.

Assuming that a vehicle wishes to be parked and that all of the elevators are up in their parking spaces, this means that the switches 43 and 44 are closed and the switch 47 is open. Thus, by closing the switch 42 the motor 32 will be energized to bring the elevator associated therewith from its parking space to its lowermost position so that the vehicle can be driven onto the channels 15. The switches 43 and 44 will then be open and when the switch 41 is closed the motor 32 will be energized to raise the elevator with the vehicle thereon and move it into its proper parking space until the switch 47 is opened by the elevator which breaks the circuit.

Each of the other elevators is actuated in the same manner by apparatus similar to that described above. Thus, motor 49 (see Fig. 2) will move the second

elevator up and down; **50** the third elevator; **51** the fourth elevator; and **52** the fifth elevator. Each elevator and the motor associated therewith is electrically connected to similar operating and safety switches as shown in Fig. 6; it being understood that when any elevator is down the switches **43** and **44**, and similar switches in the control circuit of each elevator, are open so that no other elevator can be brought down while these switches are open.

While I have described my invention in its preferred embodiment, it is to be understood that the illustrations are more or less diagrammatic. However, the words which I have used are words of description rather than of limitation and that changes, within the purview of the appended claims, may be made without departing from the true scope of my invention in its broader aspects.

What I claim is:

1. A vehicle parking device comprising an elevator platform adapted to support a vehicle thereon; upright members secured to two opposite corners of said platform and extending upwardly to a level above a vehicle supported on said platform; each of said members having a first roller rotatably mounted on a horizontal axis adjacent the top thereof, and a second roller rotatably mounted on a horizontal axis adjacent the bottom thereof; said top rollers being substantially coaxial and said bottom rollers being substantially coaxial; fixed channels in which the rollers on said members are ridable; said channels having upright portions in which said rollers are positioned when said elevator is at its lowest level and which curve smoothly into horizontal portions of a length adapted to support said platform when said rollers are positioned in said horizontal positions; a reversible motor; and four separate cables each having both its ends connected to one of said rollers; and means driven by said motor and cooperating with said cables for raising and lowering said platforms.

2. The structure set forth in claim 1 in which the means driven by said motor comprises two pulleys around which said cables are wound.

3. The structure set forth in claim 1 together with a first, platform-actuated switch for automatically stopping the motor moving said platform when said platform is in its lowest position; and a second platform-actuated switch for stopping said motor when said platform is in its raised, vehicle-parking position.

4. A vehicle parking device comprising a plurality of generally rectangular elevator platforms each adapted to support a vehicle thereon; an upright member secured to each of two opposite corners of each platform and extending upwardly to a level above a vehicle supported on the platform; each of said members having a first roller rotatably mounted on a horizontal axis adjacent the top thereof and substantially coaxial with each other, and a second roller rotatably mounted on a horizontal axis adjacent the bottom thereof and substantially coaxial with each other; a separate channel for each roller on each elevator platform in which said rollers are ridable; said channels comprising closely spaced, parallel-disposed vertical portions, in which said rollers ride when said platforms are moving up and down, curving smoothly into horizontal portions in which said rollers are supported when said platforms are stopped at their upper levels; the horizontal portions of the channels associated with each platform being disposed in vertically spaced relation to said portions associated with each of the other platforms to provide spaces therebetween for vehicles when parked; a separate reversible motor for each platform; four separate cables associated with each platform; each cable having both its ends connected to one of said rollers, and having a portion thereof intermediate its ends wound around a pulley driven by one of said motors.

5. The structure set forth in claim 4 together with two, separate, manually operable switches for each platform located at the low level of said platforms for starting said motors to move said platforms up and down.

6. A parking device adapted to hold a plurality of vehicles in vertically spaced relation to each other when placed therein; said device comprising a plurality of elevators each adapted to support one vehicle when in parked position; separate means comprising four channels having vertical portions at the front of said device curving smoothly into horizontal portions at the top thereof for supporting each elevator on said horizontal portions in vertically spaced relation to the other elevators; said channels being disposed in laterally spaced pairs to pass an elevator therebetween; two vertically spaced rollers on each side of each elevator extending into and adapted to ride in the pair of channels adjacent thereto; means at the rear of said device for supporting the rear ends of the horizontal portions of said channels; a separate motor for operating each elevator; drums driven by each of said motors through speed reducing mechanisms; and four separate cables associated with each elevator, each having its ends connected to one of said rollers; and a portion thereof, intermediate its ends, wound around one of said drums.

7. A vehicle parking device comprising an elevated structure having means therein for supporting a plurality of elevators each in vertically spaced relation to the others and adapted to support a single vehicle; a separate, reversible motor for operating each elevator; at least two drums driven by each of said motors through a speed reducing mechanism; and four cables cooperating with said drums and said motors and each of said elevators for first raising the elevator vertically substantially to the level of its supporting means in said structure and then moving it laterally on to said supporting means.

8. The structure set forth in claim 7 together with a first manually actuated switch for starting each of said motors to move its associated elevator laterally from its supporting means in said structure and then lowering it to ground level to receive a vehicle; and a second manually actuated switch for starting said motor to raise said elevator with said vehicle thereon and move it laterally on to its supporting means.

9. The structure set forth in claim 7 together with a first manually actuated switch for starting each of said motors to move its associated elevator laterally from its suporting means in said structure and then lowering it to ground level to receive a vehicle; a second manually actuated switch for starting said motor to raise said elevator with said vehicle thereon and move it laterally on to its supporting means; a first switch automatically actuated by each elevator when moved on to its supporting means for stopping its motors; and a second switch automaticaly actuated by an elevator when moved into its lowest position for preventing the operation of each of said motors when the first manually actuated switch associated therewith is closed.

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