United States Patent [19]

Greer

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[45] **Aug. 7, 1973**

[54] **VERTICAL-LIFT DOUBLE-DECK PARKING STRUCTURE**

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[22] Filed: **Mar. 18, 1971**

[21] Appl. No.: **125,700**

[52] **U.S. Cl.** ..... **214/16.1 EC**, 187/8.59

[51] **Int. Cl.** **B66f 7/04**

[58] **Field of Search** ..... 214/16.1 EC, 16.1 E, 214/16.1 ED, 707, 660; 187/8.59

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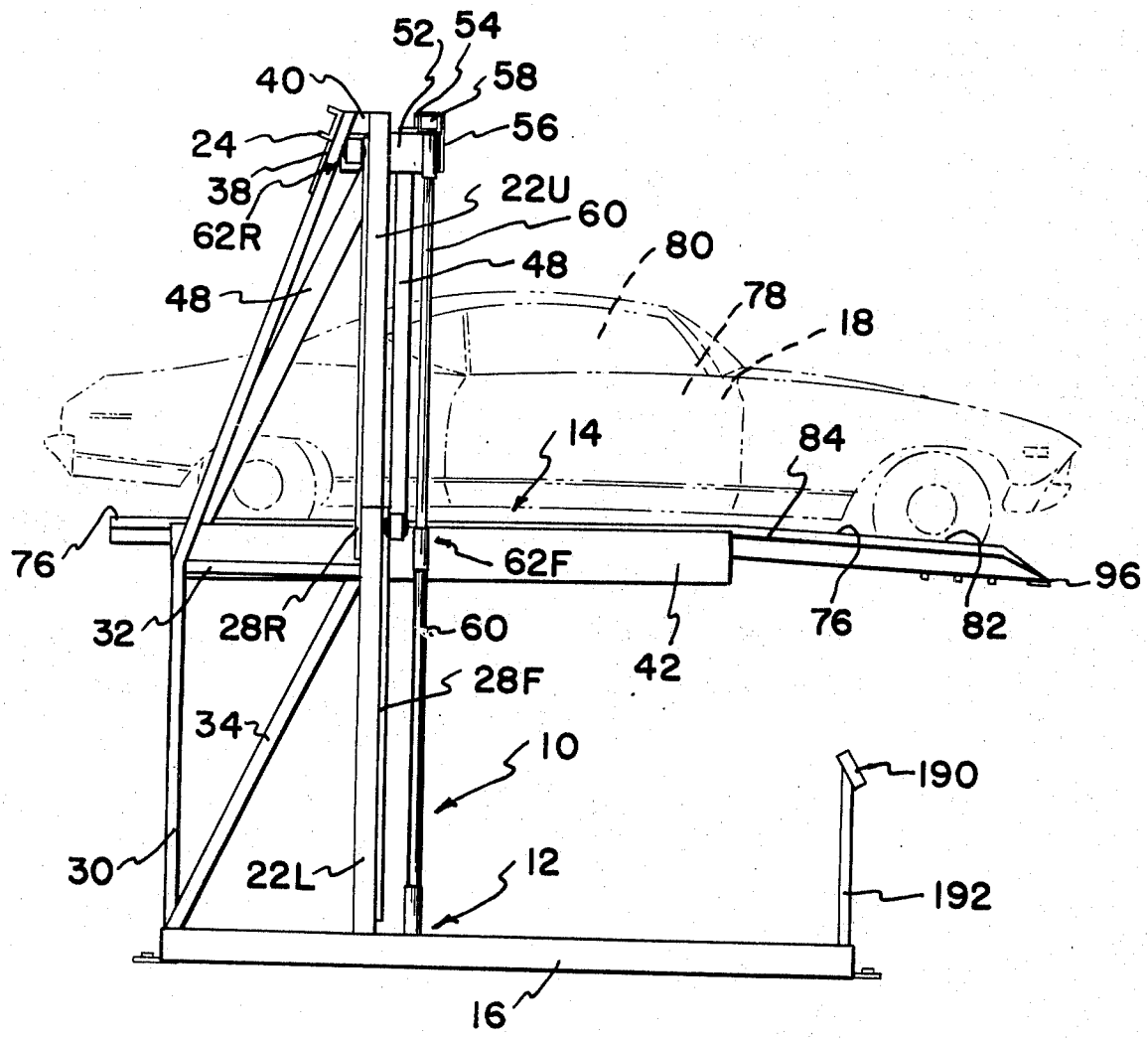
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Primary Examiner—Robert J. Spar
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[57] **ABSTRACT**

This invention relates to a double-decked parking structure having a ground-anchored bedframe carrying two upright stanchions located in transversely spaced parallel relation to one another so as to admit an automotive vehicle therebetween. These stanchions each carry two rails, one on the front face extending from near ground level up to at least roof-top height and the second continuing on up beyond the first but along the rear face thereof. An elevatable subframe is mounted between the stanchions for movement vertically thereof between a raised or elevated position and a lowered one resting on the ground. This subframe includes a horizontal vehicle-support platform, the major portion of which projects forwardly beyond the stanchions, and a pair of upright masts that mount grooved rollers which run along the rails. A pair of hydraulic rams connected between the bedframe and subframe are operative upon actuation to raise and lower the latter.

20 Claims, 16 Drawing Figures



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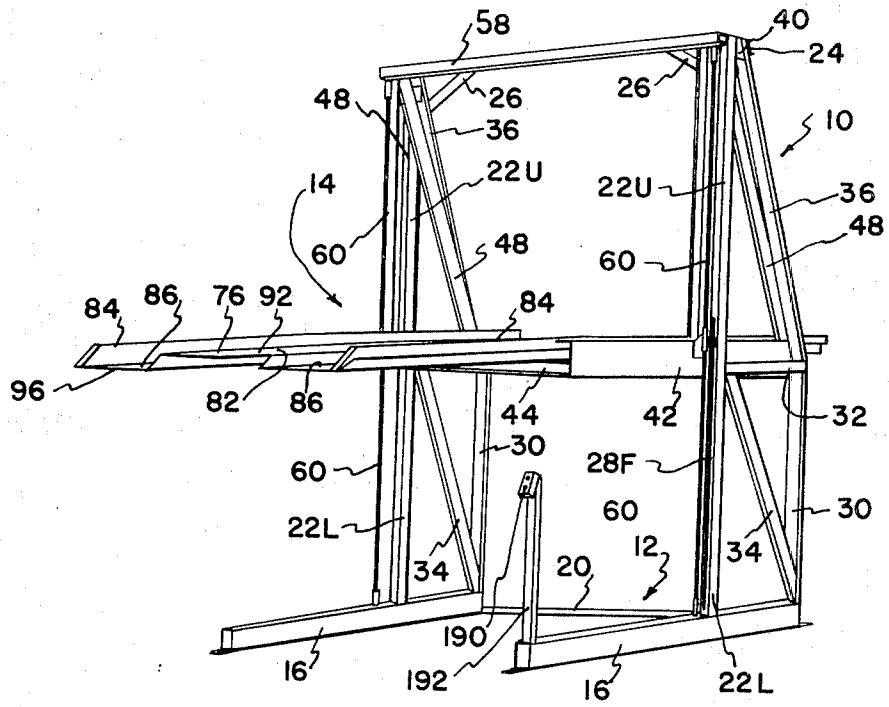


FIG. 1

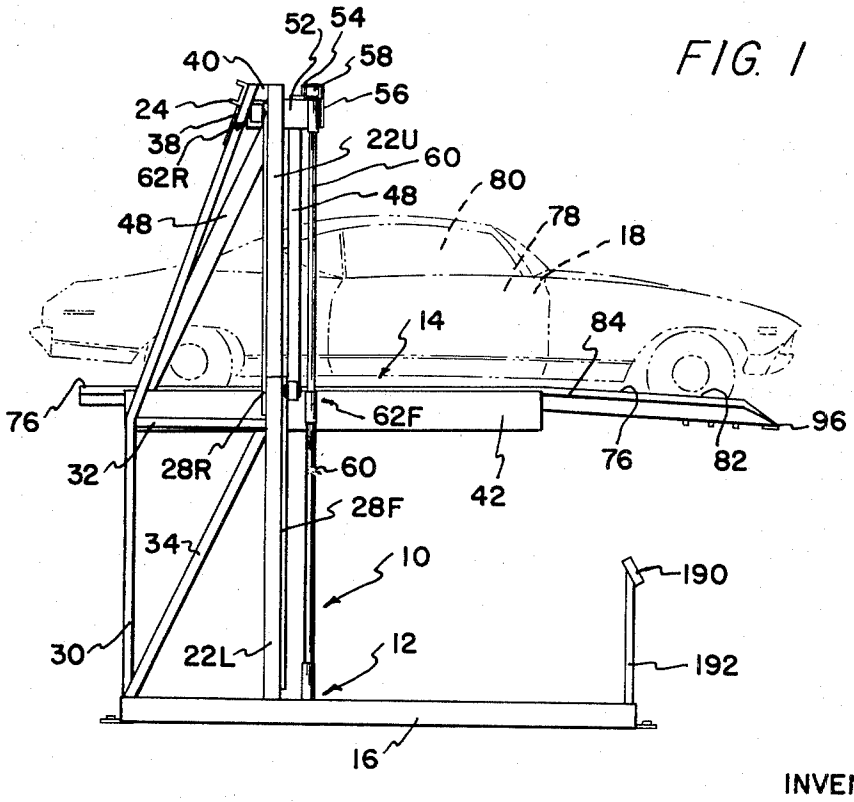


FIG. 2

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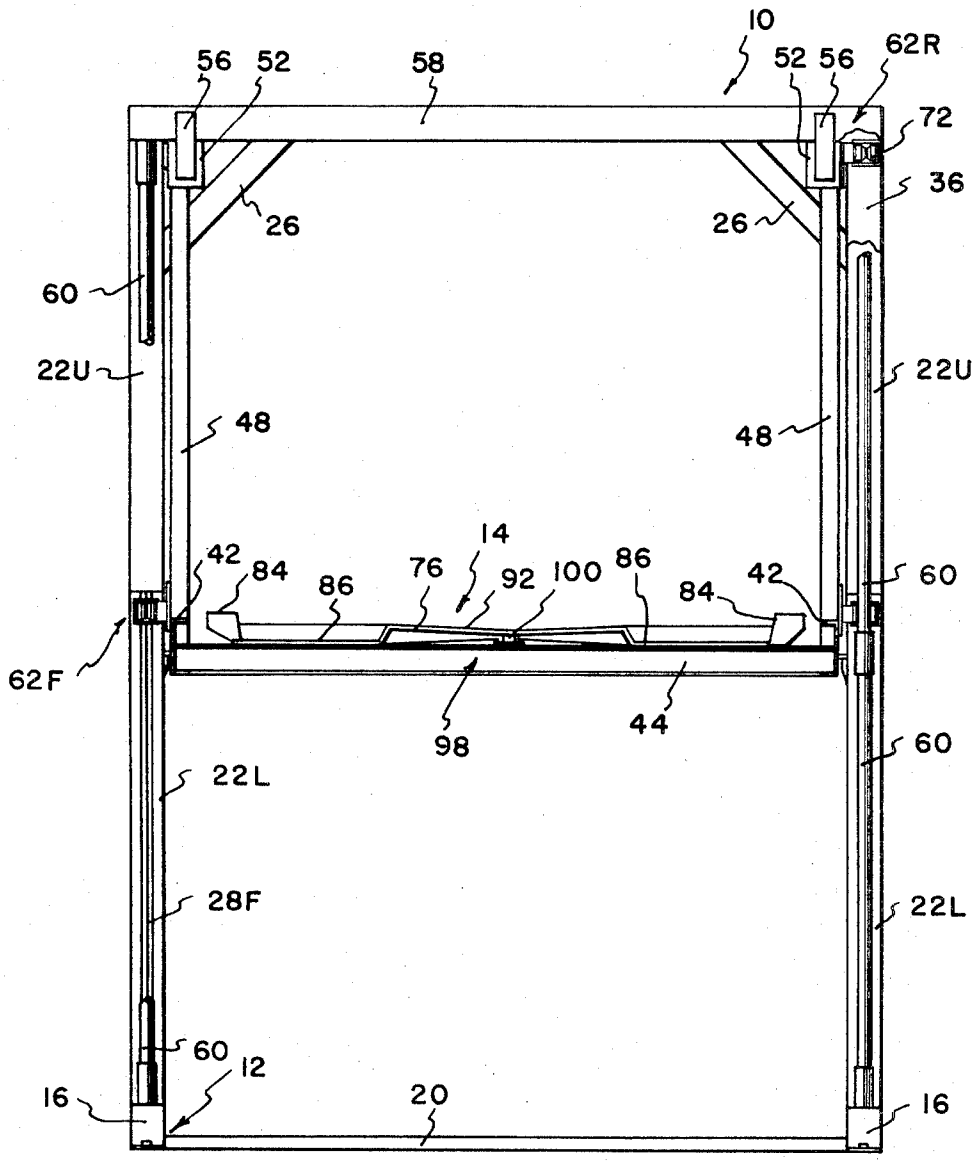


FIG. 3

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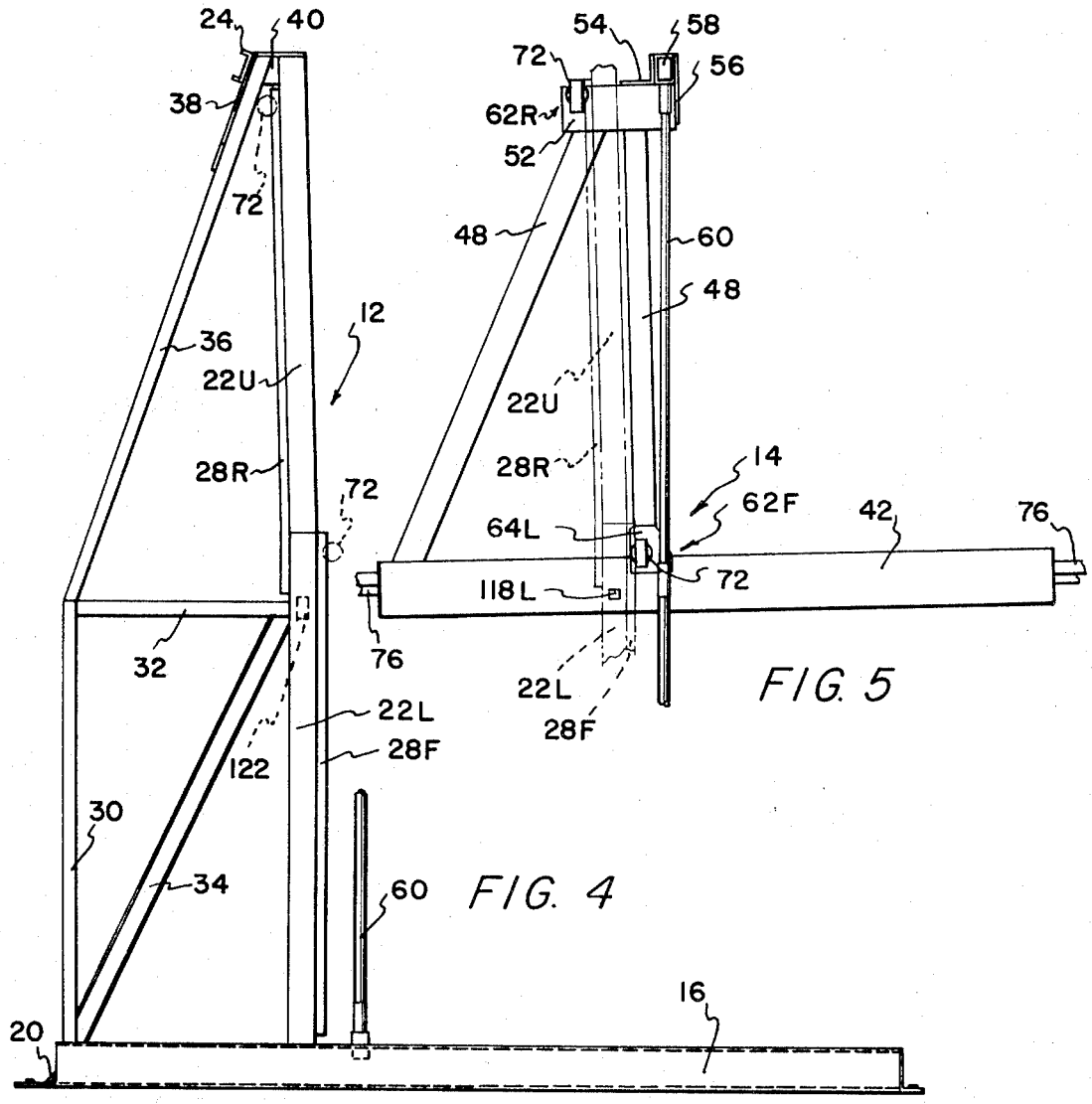


FIG. 4

FIG. 5

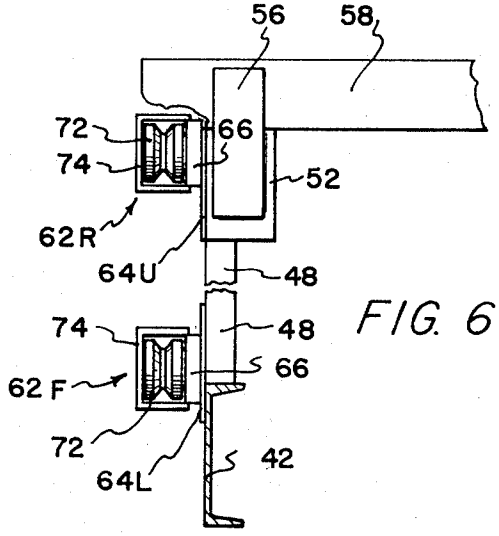


FIG. 6

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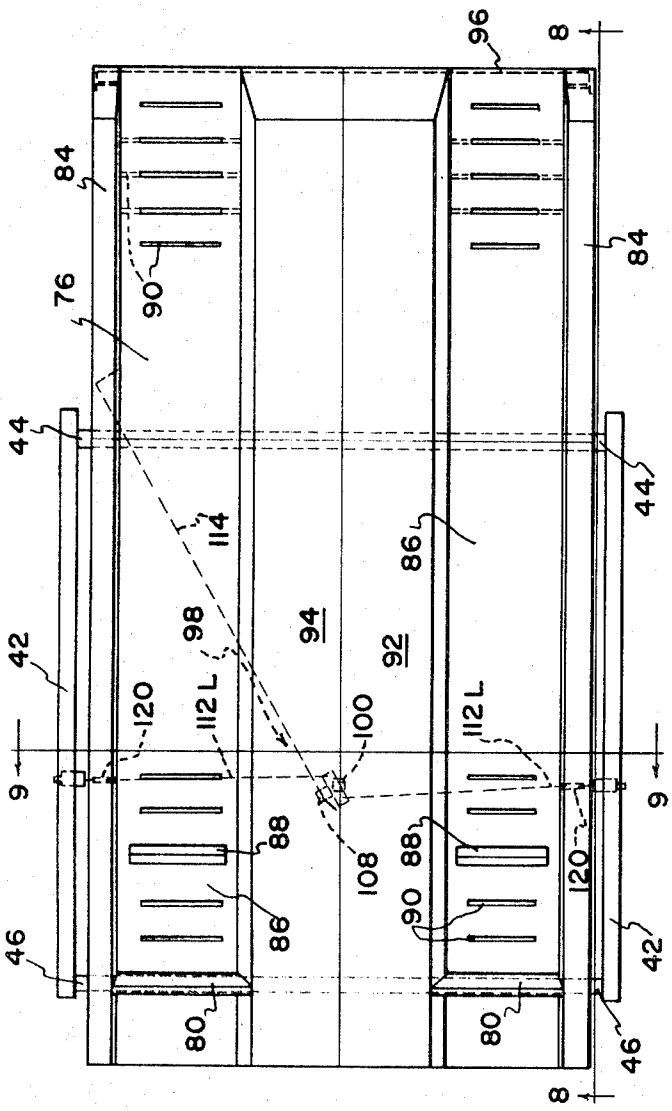


FIG 7

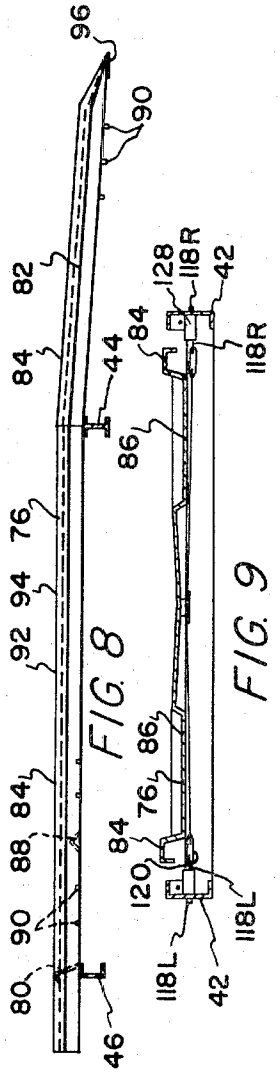


FIG 8

FIG 9

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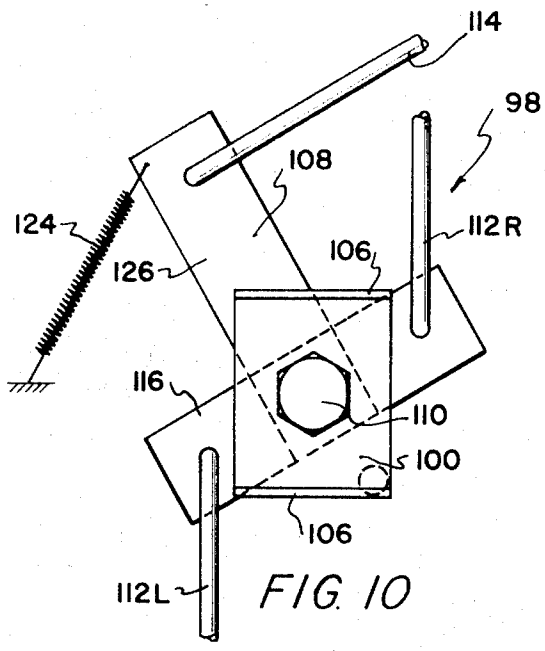


FIG. 10

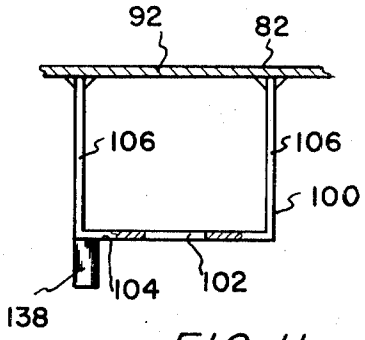


FIG. 11

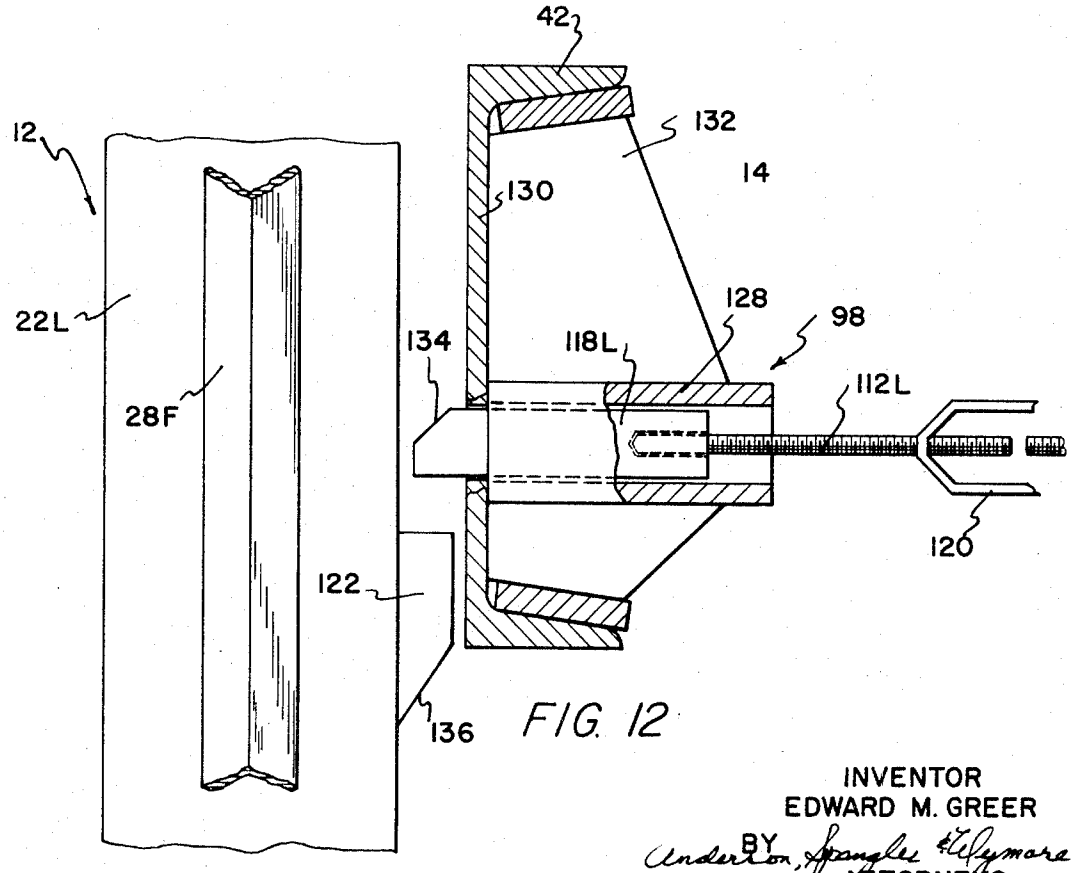


FIG. 12

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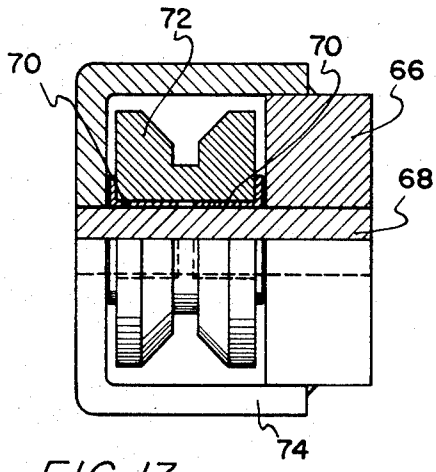


FIG. 13

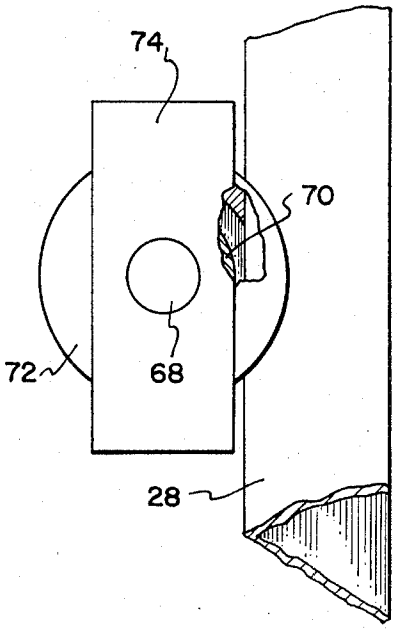


FIG. 14

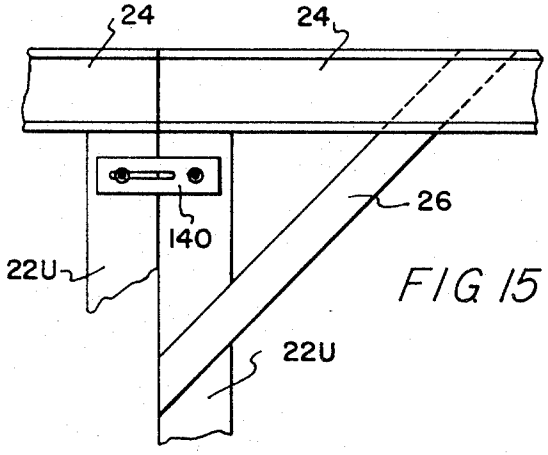


FIG 15

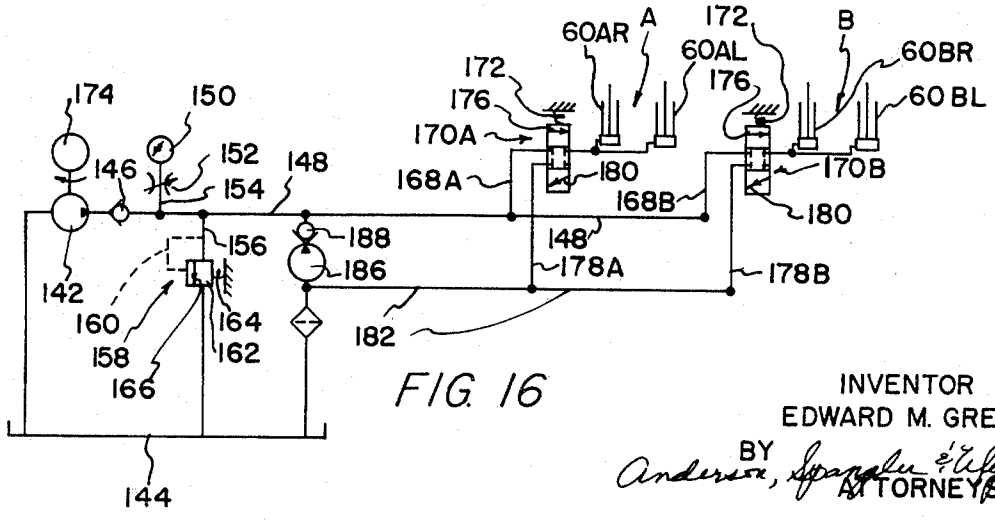


FIG. 16

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VERTICAL-LIFT DOUBLE-DECK PARKING STRUCTURE

A more efficient and, therefore, economical use of land for parking purposes has been a goal of the parking lot operator, landowner and others almost since the advent of the modern automobile. The multilevel concept, either above or below ground, offers the only hope for increasing utilization of a given land area for parking automobiles. This concept has found expression in many different physical forms, some of which are in widespread use especially in congested urban areas.

The principal type of multilevel parking structure is, of course, the parking building with ramps or elevators being used to get the vehicles to the various parking areas. This type of parking structure can be built either above or below ground. While widely used, multistoried parking buildings are generally considered uneconomical and most of them, for this reason, are operated at the break-even point or perhaps at a loss in conjunction with some more profitable business like a bank as a convenience for its customers.

Open framework multilevel parking structures of both the ferris wheel type and those having elevators carrying the cars on pallets to selected stalls or pigeonholes have enjoyed only minimal public acceptance and this largely in Europe and the Far East rather than the United States. In addition to being aesthetically unacceptable to many people, the retrieval time is often excessive and mechanical breakdowns result in the cars being trapped until repairs can be made.

One solution to the increased utilization of a parking area that is proving quite acceptable is to double-deck the vehicles. One unit of this type utilizes a tilt-up principal to lift one car into a superimposed position where a second can be located therebeneath. Heretofore, however, a double-deck unit employing a straight vertical lift has not enjoyed any widespread commercial success.

The vehicle lifts used in the service bays of garages and gasoline stations provide no answer to the double-deck parking problem because no second vehicle is ever placed underneath the one in elevated position. Thus, the commonplace centerpost hydraulic lifts can be used with excellent results in a garage while the same unit would be useless on a parking lot as a means for stacking two cars one above the other. Even those filling station lifts having the vehicle-support platform lifted at the corners by upstanding cornerposts are far too complicated and expensive to ever be practical as a parking lot lift mechanism even though, conceivably, a second car could be accommodated beneath the first.

One of the major problems that must be solved in a vertical lift double-deck parking structure is access to the driving compartments of both cars when located at ground level. Another is adequate shielding for the roof of the car underneath so as to protect it against crankcase drippings, grease and even snow and water from the car above. Safety devices to insure that the vehicle-support platform remains securely latched in elevated position whether loaded or not are, of course, very necessary. On the other hand, if a power failure or some other type of malfunction should occur, means must be provided for lowering the vehicle-support platform to ground level so as to retrieve the car therefrom.

It has now been found in accordance with the teaching of the instant invention that these and other problems can be overcome while, at the same time, providing an economical vertical-lift double-deck parking structure by mounting the vehicle-support platform between a pair of upstanding stanchions in forwardly offset relation to the latter and lifting same with a pair of simple hydraulic rams. By displacing the major part of the platform forwardly of the stanchions, both doors to the driving compartment are free to swing open thus providing the necessary access thereto for the driver. This overhanging platform creates a condition of imbalance that produces a torsional moment on the stanchions tending to bend them forwardly. Such torsional moment is used to hold a pair of vertically spaced and horizontally offset rollers mounted on each mast of the subframe for the vehicle-support platform in secure rolling engagement with rails on the front and rear stanchion faces. Conversely, this roller-rail connection supports the platform in cantilever fashion for vertical movement up and down the stanchions. Self-actuating latches releasably lock the subframe in its elevated position and, with these latches released, one can bleed the rams at a controlled rate to manually lower the platform in the event of a malfunction of some sort.

It is, therefore, the principal object of the present invention to provide a novel and improved vertical-lift double-deck parking structure for automotive vehicles.

A second objective is the provision of a unit of the type aforementioned that takes up no more ground area than that required to park a single car.

Another object of the within described invention is to provide a vehicle lift for parking lots that doubles the capacity of the area without requiring additional personnel.

Still another objective of the invention forming the subject matter hereof is to provide a unit of the class described having a cantilevered vehicle-support platform that leaves the driving compartment fully accessible through either door.

An additional objective is the provision of a vehicle-lifting and storing apparatus that can be "ganged" so that several such units can be operated by a single hydraulic pump thus effecting a substantial cost saving.

Further objects of the invention herein disclosed and claimed are to provide a double-decked parking structure that is simple, rugged, relatively inexpensive, reliable, easy to operate, safe, versatile, maintenance-free, unobtrusive and one capable of handling nearly all U.S. and foreign-made passenger automobiles regardless of size.

Other objects will be in part apparent and in part pointed out specifically hereinafter in connection with the description of the drawings that follows, and in which:

FIG. 1 is a perspective view looking slightly down and to the left upon the double-deck parking strucrure;

FIG. 2 is a side elevation of the unit, an automobile having been indicated by broken lines in elevated position on the raised vehicle-support platform;

FIG. 3 is a front elevation of the unit to an enlarged scale, portions of one stanchion having been broken away to reveal the upper grooved roller carried by the subframe;

FIG. 4 is a side elevation similar to FIG. 2 but to a larger scale showing the bedframe, stanchions and associated braces without the subframe;

FIG. 5 is a side elevation to the same scale as FIG. 4 showing the subframe in relation to the stanchions, the latter having been shown in broken lines;

FIG. 6 is a fragmentary elevational view to a further enlarged scale showing the roller subassemblies on one side of the subframe, portions of the latter having been broken away to conserve space;

FIG. 7 is a top plan view of the vehicle-support platform and associated elements of the subframe to which it is attached;

FIG. 8 is a longitudinal section taken along line 8—8 of FIG. 7;

FIG. 9 is a transverse section taken along line 9—9 of FIG. 7;

FIG. 10 is a fragmentary detail to an enlarged scale showing the pivoted T-crank that simultaneously disengages the latch pins;

FIG. 11 is a fragmentary sectional detail to the same scale as FIG. 10 showing the bracket that pivotally mounts the T-crank;

FIG. 12 is a fragmentary elevational detail to the same scale as FIGS. 10 and 11 showing a latch pin and the associated stop engaged thereby, portions of the tubular latch pin guide having been broken away and shown in section to more clearly reveal the interior construction;

FIG. 13 is a fragmentary front elevational detail showing one of the grooved rollers along with the mounting therefor, half having been shown in elevation and the other half in diametrical section;

FIG. 14 is a fragmentary side elevational detail of the grooved roller and rail therefor to the same scale as FIG. 13 with portions of said roller having been broken away and shown in section to better reveal the interior construction;

FIG. 15 is a fragmentary elevational view showing the manner in which one of the stanchions is detachably connected to a stanchion of a second unit located alongside thereof; and,

FIG. 16 is a schematic hydraulic diagram showing the system as used to independently control two lifts.

Referring next to the drawings for a detailed description of the present invention and, initially, to FIGS. 1 – 5, inclusive for this purpose, reference numeral 10 has been chosen to designate the vertical-lift double-deck parking structure of the present invention in its entirety while numerals 12 and 14 are employed to similarly denominate the bedframe and subframe, respectively, thereof. The bedframe 12 has a pair of horizontally disposed base members 16 that extend longitudinally along the ground in transversely spaced essentially parallel relation to one another so as to admit a passenger automobile 18 (broken lines in FIG. 2) therebetween. The front ends of these base frame members are not connected together in the particular form shown although the rear ends thereof are interconnected by a transverse element 20. As revealed most clearly in FIG. 4, transverse element 20 comprises a length of angle iron laid flange-edge-down to define an inverted V-shaped wheel chock against which the rear wheels of the car on the ground are positioned.

Mounted atop the base members 16 are a pair of upstanding transversely spaced parallel stanchions 22 that are interconnected at their upper ends by transverse member 24 to define an arch. Diagonal braces 26 in the upper corners prevent sidewise movement of the arch under load. These stanchions each comprise two sections welded together in end-to-end relation, the lower section 22L being essentially vertical while the upper section 22U is tilted rearwardly a few degrees. The front faces of each of the lower sections 22L carry a pair of transversely spaced parallel rails 28F (FIGS. 4 and 5) having a generally V-shaped cross section while the rear faces of the upper sections 22U are similarly provided with V-shaped rails 28R, the lower ends of which extend down onto the rear faces of lower sections 22L and thus overlap rails 28F for a few inches even though on opposite faces of the stanchions.

Each of these stanchions is truss-braced against a forward bending moment by tying same to the base frame members 16. Upright member 30 parallels the lower section 22L of the stanchion spaced to the rear thereof and horizontal member 32 cooperates therewith and with the base member to define a rectangle braced by diagonal 34 extending from the lower rear corner to the top front one. A second diagonal brace 36 cooperates with diagonal 34 and with the upright 30 and upper stanchion section 22U to define a parallelogram reaching upwardly and forwardly to the upper half of each stanchion. A corner bracket 38 and fillet plate 40 at the top corner complete the truss-bracing as revealed most clearly in FIG. 4.

Next, particular reference will be made to FIGS. 1, 2, 3, 5 and 6 for a detailed description of the subframe 14. A pair of transversely spaced side frame elements 42 extend longitudinally in parallel relation and are interconnected by front and rear cross frame members 44 and 46, respectively. The aforementioned elements of the subframe 14 cooperate to define a rectangular box frame sized to fit between the base elements 16 of the bedframe 12. A pair of transversely spaced parallel mast members 48 project vertically from the side frame elements 42. These mast elements are transversely aligned with one another and are attached at points intermediate the ends of the side frame elements 42. Angle braces 50 extend upwardly and forwardly from the rear ends of the side frame elements 42 to box connector 52 that extends longitudinally between the top of the latter and the top of the mast members 48.

A pair of angle brackets 54 cooperate with face plates 56 to fasten a box beam 58 to the top of the box connectors 52 as shown most clearly in FIG. 5. Beam 58 extends transversely across the top forward edge of these connectors 52 and cooperates therewith and with the mast elements 48 to define a bail that is used to lift the subframe. Note in FIGS. 1 and 6 that the box beam has the opposite ends thereof projecting out beyond the mast members forwardly thereof and in overhanging relation to the base elements of the bedframe 12 where the hydraulic servomotors 60 are connected therebetween that become operative upon actuation to raise and lower the subframe.

Next, as seen most clearly in FIGS. 2 and 5, the mast members 48 are positioned just ahead of and inside the stanchions 22 to which they are connected for relative rolling engagement by means of grooved roller subassemblies that have been identified in a general way by numerals 62F and 62R that will now be described in detail in connection with FIGS. 6, 13 and 14. Welded or otherwise attached to the outside of box connector 52 spaced rearwardly of mast element 48 (FIG. 5) is a reinforcing plate 64U that carries the block 66 from which stub shaft 68 projects transversely. A pair of flanged bushings 70 fit over the shaft and journal cir-

cumferentially grooved roller **72** for rotation thereon about a horizontally extending transverse axis. A vertically extending U-shaped yoke **74** is fastened to the block **66** so as to cooperate therewith to define a rectangular opening for the roller while providing support for the outer end of the stub shaft as well as holding the bushings in assembled relation on the latter. Both the front and rear portions of the rollers **72** project well beyond the corresponding vertical margins of the yoke **74** in position to engage the V-shaped rails **28** in the manner clearly revealed in FIG. **14.**

A similar plate **64L** (FIGS. **5** and **6**) is fastened to the outside of the mast element **48** adjacent the lower end thereof where it mounts the block **66,** stub shaft **68,** bushings **70,** grooved roller **72** and yoke **74** of the lower grooved roller subassembly **62L.** Thus, as revealed most clearly in FIG. **5,** the lower roller subassembly **64L** rides vertically along the front rail **28F** on the lower section **22L** of the stanchion while the upper roller subassembly **62R** rides up the rear rail **28R** on the upper section **22U** thereof. The length and location of the rails is such that the grooved roller subassemblies travel between the ends thereof as the subframe **14** travels from its lowermost position resting on the ground between the base members **16** of the bedframe **12** to its fully raised or elevated position shown in FIGS. **1, 2** and **3.** Note also in connection with FIG. **2** in particular that the center of gravity of automobile **18** lies well forwardly of the mast elements **48** of the subframe thus producing a forwardly overbalanced condition tending to turn the subframe clockwise and force both roller subassemblies **62L** and **62U** tightly against their respective rails **28.** It is this same relationship that allows the automobile **18** to sit atop platform **76** sufficiently far forward to permit the doors **78** to the driver compartment to be opened in both the lower and upper positions of the subframe. Also, the slight rearward inclination of the upper section **22U** of the stanchions causes a corresponding elevation in the front end of platform **76** so that it reaches its uppermost position with a slight rearward tilt that holds the rear wheels of the car securely up against rear wheel chocks **80** so that it cannot roll forward accidently.

In FIG. **7, 8** and **9** to which reference will now be made, the platform **76** is most clearly shown that forms an integral part of subframe **14.** This platform rests atop and is fastened to the front and rear cross frame members **44** and **46** of the box frame between side frame elements **42** thereof. The front cross frame member **44** is positioned just forward of the transverse center line of the platform so that a goodly portion **82** of the latter projects forwardly therebeyond while the rear cross frame member lies closely adjacent the rear end thereof. As shown, the rear wheel chocks **80** are directly over the rear cross frame member **46** so that the rear wheels of the vehicle come to a stop rather close to the rear edge of the platform.

The platform is rectangular in shape with upstanding wheel-engaging curbs **84** bordering both side margins thereof. Adjacent these curbs on the inside thereof in transversely spaced parallel relation to one another lie a pair of wheel-receiving channels **86** that extend longitudinally of the platform. The rear wheel chocks **80** along with a front pair **88** spaced forwardly of the latter are located within these channels. Transverse ribs **90** in the bottom of the channels where the vehicle wheels will come to rest provide reinforcement in these areas of maximum loading. The area between these channels is taken up by an island **92** having a shallow trough-shaped configuration adapted to catch crankcase drippings, water and snow and convey it off the ends where it will miss the car underneath.

When the subframe **14** is resting on the ground, the cross frame elements **44** and **46** thereof hold the major portion **94** of the platform in horizontal position but off the ground by an amount orresponding to the depth of the aforesaid cross frame elements as shown quite clearly in FIG. **8.** The portion **82** thereof lying forwardly of cross frame element **44,** on the other hand, slopes downwardly to ground level where the feathered leading edges **96** at the front extremity of the channels **86** receive the vehicle wheels.

Next, looking at FIGS. **3, 7** and **9 – 12,** inclusive, it will be seen that a safety latch subassembly indicated broadly by reference numeral **98** releasably latches the subframe **14** in its elevated position on the stanchions **22** of the bedframe. A U-shaped bracket **100** with an opening **102** in the horizontal web **104** thereof has its paralel flanges **106** welded to the underside of the platform island **92** approximately midway between the side margins thereof. A T-shaped crank **108** is mounted on the underside of bracket **100** for pivotal movement about a vertical axis defined by pin **110** passing down through opening **102,** The purpose of bracket **100** is to lower the T-crank down far enough for rigid links **112L, 112R** and **114** to pass substantially horizontally beneath channels **86.** Right and left links **112R** and **112L** have their hooked inner ends pivotally attached to opposite ends of the cross bar **116** of the crank as shown in FIG. **10** while the outer ends thereof are threaded into retractable latch pins **118R** and **118L,** respectively. In the particular form shown, each of the links **112** comprises two threaded rod sections of opposite hand interconnected in end-to-end relation by a turnbuckle **120.**

Rotation of the crank counterclockwise as veiwed from above in FIGS. **7** and **10** acts through the links **112** to extend the latch pins **118** toward the inside faces of the lower stanchion sections **22L** where they extend out over stop **122** carried thereby. A tension spring **124** connected between the stem **126** of the crank and some fixed point on the platform normally biases the crank into the counterclockwise rotation necessary to extend the latch pins.

These pins **118** are confined for transverse reciprocating movement within tubular latch pin guides **128** fastened to the inside of the web **130** of channel-shaped side frame elements **42** by means of suitable brackets **132** provided for the purpose. The outer end of the pin, of course, emerges onto the outside of the side frame element through an opening provided for this purpose in web **130.**

The upper outside corner of the latchpin is truncated as shown at **134** so as to provide a cam surface positioned to engage a similarly inclined surface **136** on the base of the stop **122** as the subframe moves up between the stanchions. These surfaces cooperate with one another to cam the latch pin into retracted position against the action of spring **124** until said pin can move into latched position above the stop. The spring **124,** of course, holds the pins in their extended latched positions until the T-crank is manually rotated clockwise by pulling upon handle-forming link **114.** A pin **138** projecting down from a corner of bracket **100** defines a

stop adapted to engage the cross bar **116** of the T-crank thus limiting the angular extent of its clockwise rotation.

In FIG. **15**, the upper right and left-hand corners of adjacent bedframes **12** have been shown fastened together by a pair of fasteners and a slotted connecting plate **140** bridging the adjacent upper stanchion sections **22U**. Several of the parking structures can be "ganged" together in this manner and operated by a single hydraulic system.

Next, with reference to FIG. **16**, it will be seen that the electrically operated pump **142** takes hydraulic fluid from a reservoir **144** and pumps it past check valve **146** into feed manifold **148**. A pressure gage **150** monitors the hydraulic pressure and a needle valve **152** connected in branch line **154** between the feed line and the gage enables the latter to be disconnected.

On downstream of gage **150** in a second branch line **156** is connected a pressure relief valve **158**. This valve becomes operative at a predetermined pressure in bypass line **160** to shift valve element **162** to the right against the bias exerted thereon by compression spring **164** thus connecting passage. Actuation of the valve element as above noted, connects branch line **156** back into the reservoir **144** through valve passage **166**. As presently operated, the dead-head pressure developed by pump **142** is about 2,100 p.s.i. which is excessive, therefore, pressure relief valve **158** is used to maintain a maximum pressure of around 1,850 p.s.i.

Parallel branch feeder lines **168A** and **168B** take fluid from manifold **148** and deliver it to manually actuated control valves **170A** and **170B**. These valves each have a "neutral" position, a "feed" position and an "exhaust" position. A spring **172** returns the valve to its neutral position illustrated following actuation to either of its operative positions. Actually, these valves are of the pedal-operated type where the operator actuates them to either lift or lower the subframe with his foot.

The two hydraulic rams **60AR** and **60AL** that are found on the right and left sides of the unit "A" subframe are connected in parallel with one another in branch line **168A** downstream of valve **170A**. Similarly, the rams **60BR** and **60BL** of the "B" unit are connected in parallel in line **168B** downstream of valve **170B**.

Now, when the pump **142** is being driven by pump motor **174**, the manifold **148** is pressurized along with branch lines **168A** and **168B** leading to the control valves. When one of these valves is shifted into its "feed" position (downwardly in FIG. **16**) the rams **60R** and **60L** associated therewith receive fluid through passage **176** thus causing the piston rods **178** to extend simultaneously lifting the subframe **14** riding atop thereof. Conversely, shifting the control valve **170** into its "exhaust" position connects the ram cylinders into one of the exhaust line branches **178A** or **178B** through port **180** and these branches, in turn, join exhaust manifold **182** which returns fluid to the reservoir **144** through filter **184**. If, for some reason, motorized pump **142** is broken down or otherwise inoperative to actuate the rams **60**, a hand pump **186** connected between the feed manifold **148** and reservoir **144** can be used for this purpose. A check valve **188** prevents fluid from reentering the hand pump during the return stroke thereof when the motorized pump **142** is being used to actuate the rams **60**.

Motor **174** is controlled by a starting switch **190** located on a stand **192** at the front of the bedframe as shown in FIGS. **1** and **2**. The operator turns this switch on to energize the motor and start the pump before he actuates a control valve. These control valves will all be in neutral position cutting off the supply of fluid to the hydraulic rams. The fluid will merely be circulating through the pump and pressure relief valve back to the reservoir until a control valve is actuated.

With a car on the vehicle support platform and the latter on the ground, the operator will actuate the control valve to its "feed" position thus allowing fluid to enter the hydraulic cylinders and raising the subframe on the piston rods. Once the subframe has elevated to the top of the stanchions and the piston rods are fully extended, the fluid will, once again, return to the pump past the pressure relief valve as the fluid pressure rises above the predetermined maximum.

Release of the control valve to its neutral position will seal off the fluid in the cylinders and lines leading thereto downstream of said valve thus keeping the subframe in its elevated position. When the time comes to lower the car on the elevated platform to the ground, it is only necessary to manually retract the latch pins **118** and shift the control valve into its "exhaust" position thereby allowing the fluid to drain from the cylinders at a controlled rate. This, of course, is done with the pump de-energized as it or the hand pump are only operative to raise the platform, not lower it.

What is claimed is:

1. The elevator for parking automotive vehicles in double-deck stacked relation which comprises: a bedframe including a pair of upright stanchions spaced apart transversely a distance adapted to receive an automotive vehicle therebetween, said stanchions having front and rear pairs of parallel rails extending longitudinally thereof; an elevatable subframe mounted between the stanchions of the bedframe for vertical movement between a lowered position at ground level and an elevated position raised to a height sufficient to receive a vehicle therebeneath, said subframe including upstanding mast members and front and rear pairs of rollers journalled on said mast members for rotation about transversely-extending horizontal axes spaced one above the other in parallel relation, said front and rear pairs of rollers being positioned and adapted to ride the front and rear pairs of rails respectively with the latter roller pair rearwardly offset above the former, and a horizontally disposed vehicle support platform extending fore and aft between the stanchions in forwardly offset relation thereto so as to continually bias the rollers against their respective tracks; a pair of upstanding extendable jack-forming subassemblies positioned in transversely spaced relation adjacent the stanchions and directly connected to the mast members of the subframe; and, common drive means connected to said jack-forming subassemblies operative upon actuation to simultaneously actuate same in the same direction and at the same speed, said jack-forming subassemblies cooperating with one another and with the subframe to raise and lower the latter with a vehcile aboard.

2. The double-decked parking structure as set forth in claim **1** in which: the front rails are essentially vertical while the rear rails have a slight rearward inclination adapted to elevate the front end of the platform above the rear end thereof.

3. The double-decked parking structure as set forth in claim 1 in which: the platform includes at least one stop positioned to engage a rear wheel of a vehicle parked thereon and hold same sufficiently far forward for the doors of the driver compartment to open clear of the stanchions.

4. The double-decked parking structure as set forth in claim 1 in which: the stanchions project substantially above a vehicle parked therebetween, the front tracks extend upwardly from a point adjacent the base of said stanchions while the rear tracks terminate adjacent the top thereof, and in which the front set of rollers are located alongside the platform.

5. The double-decked parking structure as set forth in claim 1 in which: a latch means interconnects the bedframe and subframe releasably fastening the latter in elevated position.

6. The double-decked parking structure as set forth in claim 1 in which: the jack-forming subassemblies comprise a pair of upstanding transversely spaced parallel hydraulic rams; and, in which the drive means comprises a pump connected to deliver hydraulic fluid to the latter in parallel.

7. The double-decked parking structure as set forth in claim 1 in which: the interengaged rail and roller sets define cooperating grooves and ribs that interlock to prevent relative transverse movement therebetween.

8. The double-decked parking structure as set forth in claim 1 in which: the bedframe includes longitudinally extending base members projecting forwardly of the stanchions to define a stand therefor, the subframe includes a transversely-extending cross frame element interconnecting the masts and cooperating therewith to define an arch sized to pass an automobile moved onto the platform, and in which the jack-forming subassemblies comprise hydraulic servomotors connected between the base members of the bedframe and the cross frame element of the subframe in transversely spaced substantially parallel relation to one another.

9. The double-decked parking structure as set forth in claim 1 in which: the stanchions rise to a height at least as high as that of the roof of an automobile parked on the platform when the latter is in elevated position, the front pair of rails extend from a level adjacent the bottom of the stanchions up at least as high as the elevated platform, and the rear pair of rails extend down along said stanchions from a level near the top thereof to at least said platform in elevated position.

10. The double-decked parking structure as set forth in claim 1 in qhich: at least one wheel-contacting stop is mounted between the stanchions of the bedframe spaced to the rear thereof in position to engage a rear wheel of a vehicle backed thereagainst and locate same sufficiently far forward so that the doors to the driver compartment are free to open ahead of said stanchions.

11. The double-decked parking structure as set forth in claim 1 in which: the platform is formed to provide a shallow trough extending longitudinally thereof midway between the side margins adapted to discharge fluids over the ends.

12. The double-decked parking structure as set forth in claim 2 in which: the platform includes a transversely spaced pair of parallel wheel-receiving channels terminating at the rear extremity thereof in upstanding wheel-engaging stops adapted to receive and retain a free-wheeling vehicle moving rearwardly thereagainst under the influence of said platform in tilted condition.

13. The double-decked parking structure as set forth in claim 3 in which: the bedframe includes a pair of longitudinally extending base members projecting rearwardly of the stanchions to define a stand therefor and diagonal braces interconnecting said base members and stanchions from a position behind the latter, said brace members cooperating with said base members and stanchions to define a truss frame adapted to resist the forward bending moment induced in the latter by the forwardly overbalanced subframe.

14. The double-decked parking structure as set forth in claim 5 in which: the latch means comprises at least one stop mounted on a stanchion, a latch pin mounted on the subframe for movement between an engaged position atop said stop and a disengaged position retracted out of the path thereof, spring means connected to the latch pin normally biasing same into engaged position, and a release lever connected to the latch pin operative upon actuation to release same, said release lever being accessible to an operator located outside the path of vertical movement of the subframe.

15. The double-decked parking strucrure as set forth in claim 6 in which: the hydraulic rams are of the single-acting type, the pump is connected to receive fluid from a source thereof and feed same to both rams simultaneously, a reservoir is connected to receive fluid exhausted from both rams, and a three-position control valve is connected to control the flow of fluid both to and from the rams, said valve having a neutral position operaive to isolate the rams from both the pump and reservoir so as to prevent fluid flow therebetween in either direction, a feed position connecting the rams to the pump while disconnecting them from the reservoir, and an exhaust position connecting the rams to the reservoir and disconnecting them from the pump.

16. The double-decked parking structure as set forth in claim 6 in which: a second pump is connected in parallel with the first pump, one of said first and second pumps is motor driven and the second is manually operated, and in which a check valve is located downstream of each pump operative to prevent reverse flow of fluid in one while the other is operating.

17. The double-decked parking structure as set forth in claim 7 in which: the rollers are circumferentially grooved and the rails comprise upstanding ribs.

18. The double-decked parking structure as set forth in claim 8 in which: the subframe includes overhanging portions projecting beyond the mast members out over the base members of the bedframe forwardly of the stanchions, and in which the jack-forming subassemblies are mounted in vertical position between the base members of the bedframe and the overhanging portions of the subframe.

19. The double-decked vertical parking structure as set forth in claim 9 in which: the front and rear pairs of rollers are spaced apart vertically a distance such that said front roller pair traverses essentially the lower half of the stanchions while said rear pair tranverses the upper half thereof upon movement of the subframe between its lowered and elevated positions.

20. The double-decked vertical parking structure as set forth in claim 11 in which: the front end of the platform is tilted to define a downwardly and forwardly sloping ramp when said platform is in lowered position.

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