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2,779,484

PARKING GARAGE

Filed Dec. 14, 1953

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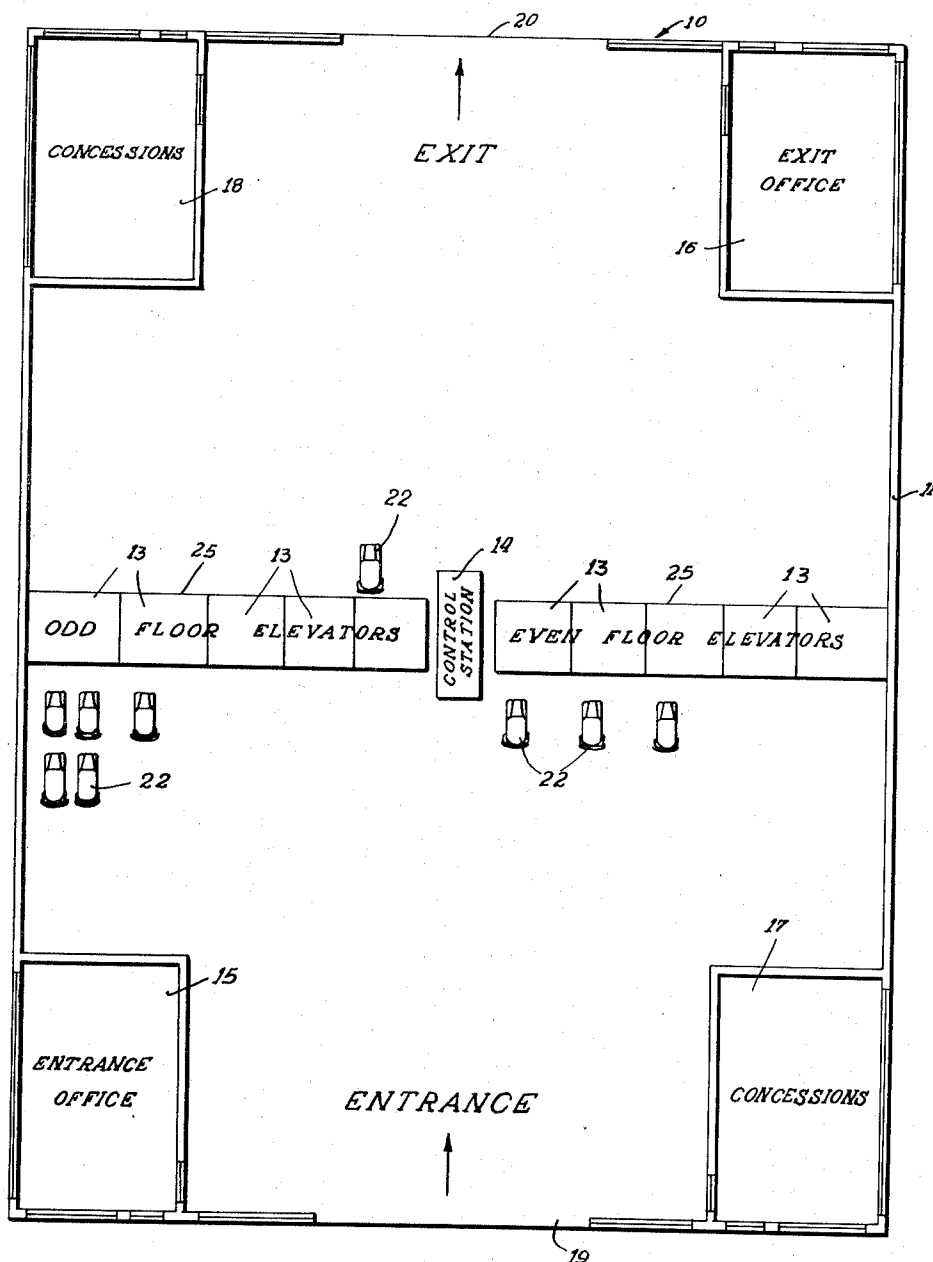


FIG. 1

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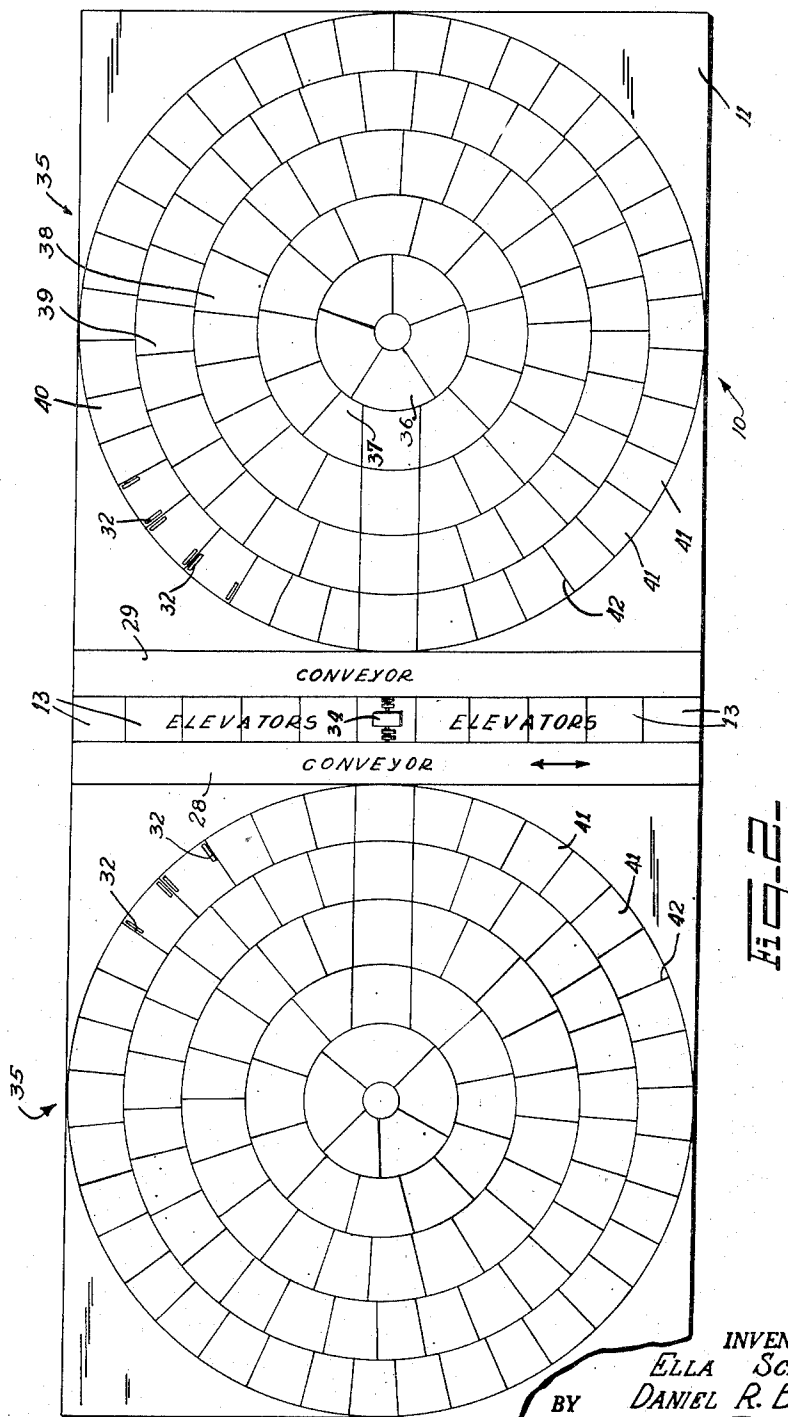


FIG. 2-

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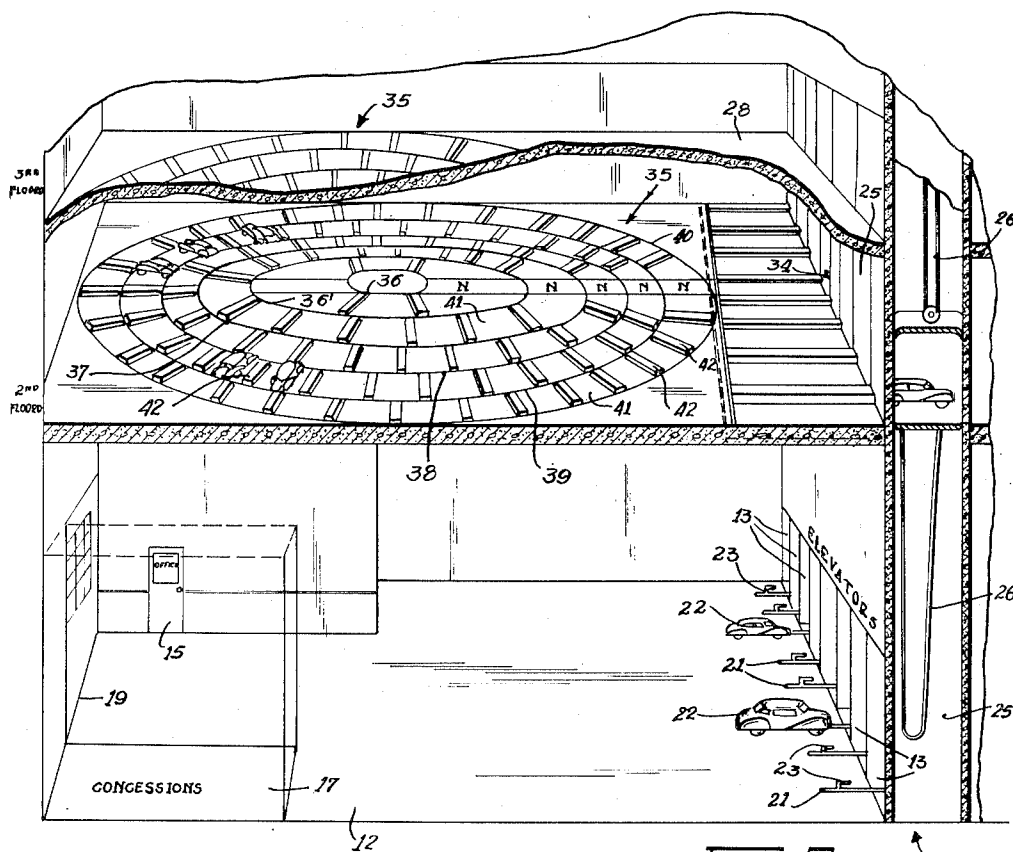


Fig. 3

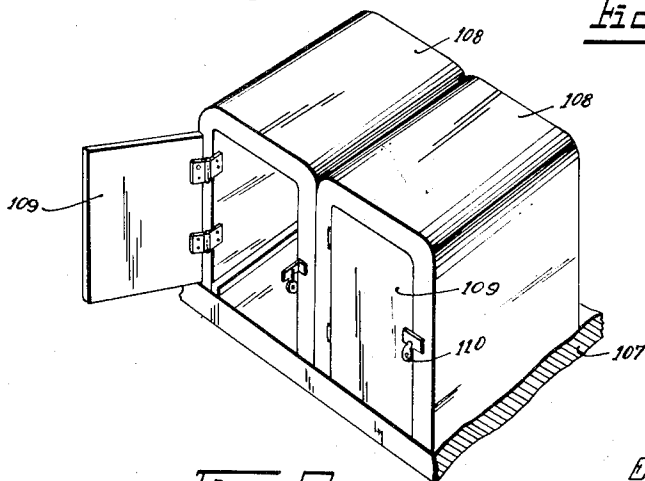


Fig. 4

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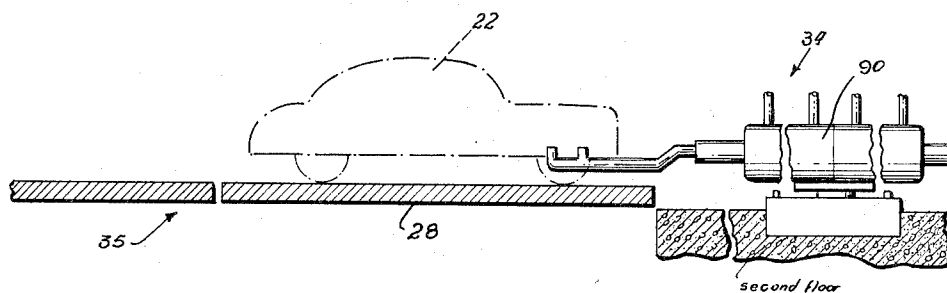


Fig. 4.

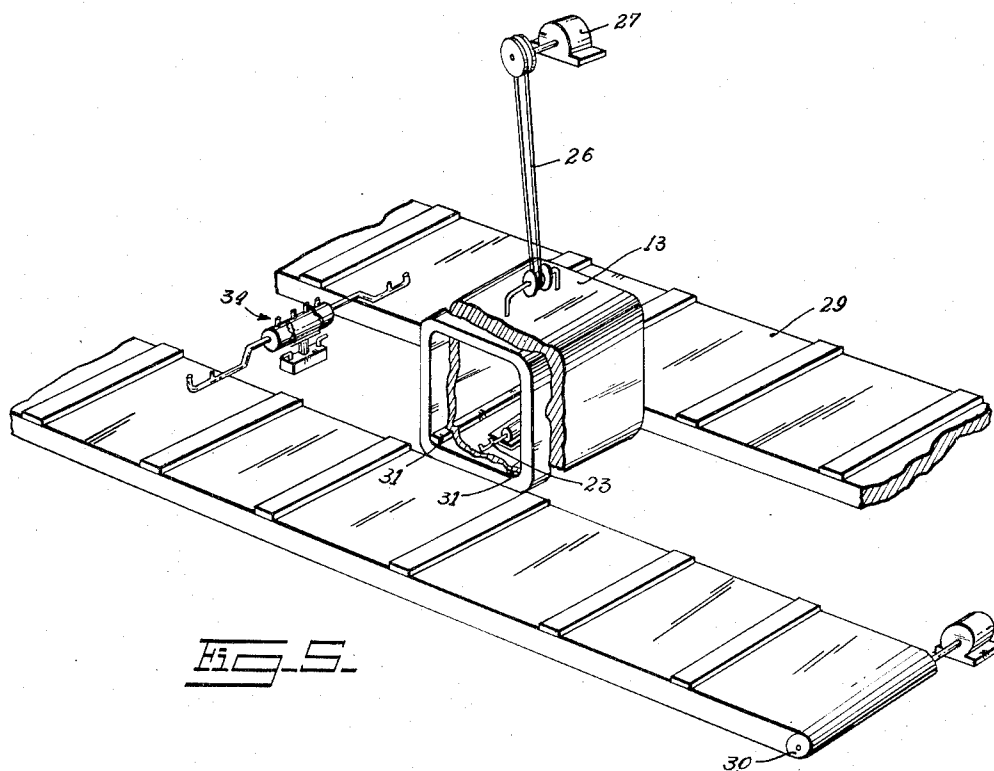


Fig. 5.

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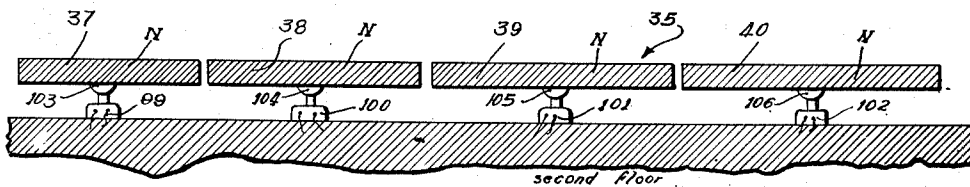
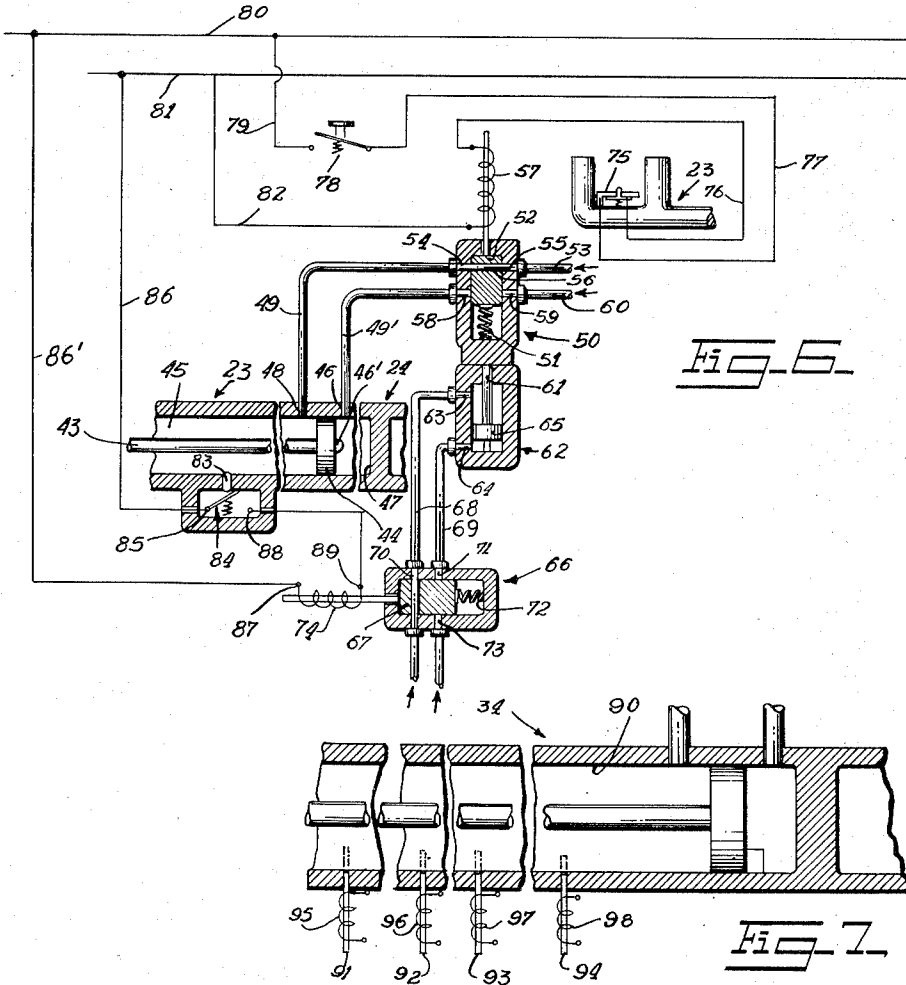


Fig. 8

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PARKING GARAGE

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This invention relates to garages and, more particularly, to a completely automatic garage.

It is an object of the present invention to provide a fully automatic garage which will house complete floors of cars and will permit any car to be readily accessible without disturbing any other car.

It is another object of the present invention to provide a garage wherein many cars can be handled in a short time, such as after the theatre, and in which everything will work from push buttons with a minimum amount of labor necessary.

Still further, the present invention proposes a garage construction in which regular parkers may have individual fireproof storage spaces which can be locked and to which they alone can retain the key.

For further comprehension of the invention, and of the objects and advantages thereof, reference will be had to the following description and accompanying drawings, and to the appended claims in which the various novel features of the invention are more particularly set forth.

In the accompanying drawings forming a material part of this disclosure:

Fig. 1 is a floor plan view of the main floor of a garage embodying the features of the present invention.

Fig. 2 is a view similar to Fig. 1 but showing one of the upper floors.

Fig. 3 is a perspective view shown partly in section and in elevation of the entrance half of the garage shown in Figs. 1 and 2.

Fig. 4 is a side view shown partly in section and partly in elevation of the means for pushing the cars to the individual stalls on the various turntables.

Fig. 5 is a circuit diagram showing the circuit for parking and removing cars.

Fig. 6 is a schematic view showing one of the elevator car pulling and pushing hooks and the controls therefor.

Fig. 7 is a fragmentary view of one of the car pulling and pushing hooks 34 and controls therefor.

Fig. 8 is a fragmentary view of the concentric turntables in cross-section and showing controls operative thereby.

Fig. 9 is a fragmentary detail view of a turntable and enclosed parking stall thereon illustrating a modification of the invention.

Referring now more in detail to the drawings, in which similar reference numerals identify corresponding parts throughout the several views, there is shown a fully automatic garage, referred to collectively as 10, and including a garage building 11, substantially as illustrated.

The garage building 11 is elongated, as shown in the several figures, and is divided into two equal halves. The building 11 is also provided with a plurality of floors which, other than the main or street level floor 12, are substantially identical.

The main floor 12 is provided along its lateral center

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line with a tier of elevators 13, an equal number of elevators being provided on each side of the longitudinal center line of the floor. The elevators 13 on one side of the longitudinal center line of the floor are for conveying cars to the even floors of the building (second, etc.), and the elevators at the other side are for conveying cars to the odd floors (third, etc.). The elevators are remote controlled, as will further be described, from a central control station 14 (see Fig. 1) located in the center of the main floor 12 of the garage. It is to be understood that in addition to having floors above the main floor 12, there may also be floors below it if the terrain so permits.

In addition, the main floor 12 may contain an entrance office 15 where parkers secure their parking tickets, an exit office 16 where parkers return their claim tickets and wait for their cars, and stores or shops 17 and 18 for concessions. Repair shops and gas stations (not shown) may also be included. The garage entrance 19 is at one end of the main floor 12 and the garage exit 20 is at the other end of the main floor 12.

Remote controlled car pulling hook grooves 21 (see Fig. 3) are located at each side of the elevators 13 in the entrance and exit halves of the main floor 12, the grooves 21 being aligned with the elevators to pull cars 22 to the elevators or from them, as later will be more fully described.

Remote controlled car pulling and pushing hooks 23 and car pulling and pushing hooks 24 (see Fig. 6) are located in each elevator to pull the cars 22 onto the elevators, hold them thereon, and push them therefrom. The hooks 23 may run in the grooves 21 or the grooves may be omitted and the hook travel over the floor.

Elevators 13 have open sides facing the entrance and exit ends of the building and are supported in shafts 25 by cables 26, which are controlled by motors 27 (see Fig. 5) to raise and lower the elevators.

On each of the floors except the main floor 12, aligned conveyor belts 28 and 29 are disposed at the two open sides of the elevators 13, the belts 28 and 29 running across or parallel to the tier of elevators. The belts 28 and 29 are mounted at each end on motor driven rollers 30 (see Fig. 5) and the top of the belts are disposed on substantially the same plane or level as the open sides of the elevators 13 when the elevators are stopped at the floor where the particular belts are located. Elevators 13 and belts 28 and 29 have raised surfaces or ridges 31 and 32, respectively, to keep cars 22 in proper place.

The conveyor belts 28 and 29 extend across the entire tier of elevators 13 and are adapted for travel in either direction. Centrally disposed in the building on each floor except the main floor and located above the main floor control station 14 are pneumatic pushing and pulling hooks 34 which are adapted to push cars 22 from the belts or pull them onto the belts 28 and 29.

In each half of the building on all floors except the main floor are a plurality of concentric turntables 35 which are disposed tangent to the conveyor belts 28 and 29 across from the pneumatic pushing and pulling hooks 34. The concentric turntables 35 have a series of tables 36, 37, 38, 39 and 40 which series can be made as numerous as space permits. Each table is divided into a number of radial parking spaces or stalls 41 by raised surfaces or ridges 42. The tables 36, 37, 38, 39 and 40 are adapted to turn in either direction so that anyone of the numbered stalls or spaces 41 can be turned to tangential alignment with the conveyor belts 28 and 29 in order that the spaces on the turntables can be filled with cars from the belt one at a time. This also permits ready access to any car without disturbing any of the parked cars. Each turntable, except the center one, is provided with a neutral space or lane N. This will permit ready removal of cars which can be done by driving them from

the turntable down the neutral lanes onto the conveyor belt or into the elevators. Preferably, however, the hooks 34 push cars 22 from the conveyor belts onto the turntables, down the neutral lanes into the aligned stall or space 41 at the end of the aligned neutral lanes or spaces. The hooks 34 likewise pull any of the cars 22 from the space on which they are parked down the aligned neutral lanes and onto the conveyor belts.

While all the individual elements of the garage, the elevator hooks 23 and 24, elevators 13, belts 28 and 29, hooks 34 and the turntables can be controlled separately by attendants, it is an object of the present invention to interconnect all the elements so that they will function automatically and permit the garage to be operated by a minimum number of attendants.

While this may be done in any one of several ways, Figs. 6, 7 and 8 illustrate electrical and mechanical controls for the hooks 23, 24 and 34. To avoid any fire hazard, hooks 23, 24 and 34 are pneumatic. Hooks 23 and 24 are identical and are mounted in the same casing. Each hook 23 and 24 has a plunger 43 (see Fig. 6) connected to a piston 44 slidably mounted in a cylinder 45. An air conduit port 46 is disposed in the cylinder 45 behind the piston 44, piston 44 having a pin 46' which abuts the rear wall 47 of the cylinder so that the piston never closes the port 46. Another air conduit port 48 is disposed in the cylinder 45 in front of the piston 44 so that air from port 48 retracts the piston 44 and its plunger and hook and air from port 46 extends the piston 44 and its plunger and hook.

Ports 46 and 48 are connected by conduits 49 and 49' to a solenoid operated air valve 50. A spring 51 in the valve 50 normally holds the valve stem 52 so that compressed air from a conduit 53 connected with a compressor (not shown) passes through the valve ports 54 and 55 and the valve stem port 56 to the port 48 of cylinder 45 to hold the hook normally retracted.

A solenoid coil 57 is provided to shift the valve stem so that the valve stem port 56 is aligned with ports 58 and 59. This lets compressed air from a conduit 60 pass into a cylinder 45 through port 46 to extend the hooks.

Hooks 23 and 24 may be made to grasp any part of a car, but as shown, are U-shaped at their free ends and adapted to fit around the axle of a car. Once extended, the hook is then raised until it fits around the axle. To do this, the cylinder 45 is mounted on the piston rod 61 of another pneumatic cylinder 62. Cylinder 62 has ports 63 and 64 in front of and behind the piston 65. A solenoid operated valve 66 having a valve stem 67 is connected with the raising and lowering cylinder 62 by conduits 68 and 69 and ports 70 and 71. A spring 72 normally holds the valve stem 67 so that air from a conduit 73 holds the piston 65 retracted and the hook in lowered position. By energizing the solenoid coil 74, the valve stem 67 is shifted so that the hook is raised.

In order to stop the hook after it has been raised enough to contact the axle of a car, a switch 75 is mounted in the U-shaped free end. Switch 75 is a normally closed switch and is connected by line 76 with the solenoid coil 57 and by line 77 with one terminal of a push button switch 78. The other terminal of push button switch 78 is connected by line 79 with power line 80. The second power line 81 is connected by line 82 with the solenoid coil 57.

Thus, when cars are lined up in front of the tiers of elevators, the operator selects the proper push button switch 78. On closing this switch, the solenoid coil 57 is energized lowering the valve stem 52 so that air passes into cylinder 45 only behind the piston 44. This extends the hook 23 until it is under the axle of the particular car. When this occurs, the piston head 44 presses in a detent button 83 in the side of the cylinder and closes a normally open switch 84. Switch 84 has one terminal 85 connected by line 86 with power line 81. The other terminal 88 of switch 84 is connected with one terminal 89 of the solenoid coil 74. The other terminal 87 of

solenoid 74 is connected by wire 86' with the other power line 80.

When switch 84 is closed, the solenoid shifts the valve stem so that the entire cylinder 45 is raised and the hook is thus brought up under the axle of the car.

When the normally closed switch 75 on the free end of the hook is pressed against the car axle, the axle opens the switch 75 thus deenergizing solenoid coil 57. Spring 51 then moves the valve stem 52 back so that air is conveyed to cylinder 45 in front of the piston, thus retracting the piston and the hook and pulling the car into the elevator.

The hook 34 which pushes cars from the conveyor belts onto the turntables and pulls them from the turntables onto the conveyor belts may be constructed similar to the hooks 23 and 24 described above. To provide means so that the proper turntable may be selected remotely, the cylinder 90 of the hook 34 may be provided by a plurality of piston stops 91, 92, 93 and 94 operated by solenoid coils 95, 96, 97 and 98 and corresponding to the turntables 37-40, respectively.

The solenoid coils 95, 96, 97 and 98 may be electrically connected to switches 99, 100, 101 and 102 which are operated by trips 103, 104, 105 and 106 located on the bottom of the outer turntables 37, 38, 39 and 40 under the neutral lanes or stalls thereon. As long as the neutral lane of the particular turntable is in car loading or unloading position, the solenoid operated piston stop in cylinder 90 will remain retracted.

The modification of the present invention illustrated in Fig. 9 is characterized by the provision of turntables each constructed and arranged as turntable 107 shown. The turntable 107 has a plurality of individual stalls or garages 108 each having a door 109 of its own which is locked by a lock 110. Regular parkers can retain the keys to their stall or garage since it is not necessary to disturb their cars to park and remove other cars on the concentric turntables.

While we have illustrated and described the preferred embodiments of our invention, it is to be understood that we do not limit ourselves to the precise constructions herein disclosed and the right is reserved to all changes and modifications coming within the scope of the invention as defined in the appended claims.

Having thus described our invention, what we claim as new, and desire to secure by United States Letters Patent is:

1. In a parking garage having a main floor and another floor, a tier of elevators to convey cars from one floor to the other, a turntable rotatably mounted on said other floor adjacent said tier of elevators, said turntable being adapted to hold cars thereon and having separate parking space segments radially provided thereon, a conveyor belt rotatably mounted on said other floor adjacent and in front of said tier of elevators between the elevators and the turntable, said turntable being tangent to said conveyor belt at one of the segmental spaces on the turntable, means to rotate the turntable to dispose parking space segments selectively tangent to the conveyor belt, and means to move the conveyor belt to convey cars from said elevators to the turntable.

2. In a parking garage having a main floor and another floor, a tier of elevators to convey cars from one floor to the other, a turntable rotatably mounted on said other floor adjacent said tier of elevators, said turntable being adapted to hold cars thereon and having separate parking space segments radially provided thereon, a conveyor belt rotatably mounted on said other floor adjacent and in front of said tier of elevators between the elevators and the turntable, said turntable being tangent to said conveyor belt at one of the segmental spaces on the turntable, means to rotate the turntable to dispose parking space segments selectively tangent to the conveyor belt, means to move the conveyor belt to convey cars from said elevators to the turntable, and

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pushing and pulling hook means to move cars from the elevators onto the conveyor belt and from the belt back to the elevators.

3. In a parking garage having a main floor and another floor, a tier of elevators to convey cars from one floor to the other, a turntable rotatably mounted on said other floor adjacent said tier of elevators, said turntable being adapted to hold cars thereon and having separate parking space segments radially provided thereon, a conveyor belt rotatably mounted on said other floor adjacent and in front of said tier of elevators between the elevators and the turntable, said turntable being tangent to said conveyor belt at one of the segmental spaces on the turntable, means to rotate the turntable to dispose parking space segments selectively tangent to the conveyor belt, means to move the conveyor belt to convey cars from said elevators to the turntable, pushing and pulling hook means to move cars from the elevators onto the conveyor belt and from the belt back to the elevators, and pushing and pulling hook means to move cars from the conveyor belt onto the turntable and from the turntable back onto the conveyor belt.

4. In a parking garage having a main floor and another floor, a tier of elevators to convey cars from one floor to the other, a plurality of concentric turntables rotatably mounted on said other floor adjacent the elevators, said turntables each being adapted to hold cars thereon and having separate parking space segments radially provided thereon, each of said turntables except the innermost having one neutral segment lane, a conveyor belt rotatably mounted on said other floor adjacent and in front of the elevators between the elevators and the turntables, said turntables each being tangent to said conveyor belt at one of the segmental spaces thereon, means separately to rotate the turntables to dispose the neutral lanes and the parking space segments selectively tangent to the conveyor belt, means to move the conveyor belt to move cars from in front of the elevators to in front of said tangential positions of the turntables, and pushing and pulling hook means to move cars from the elevators onto the conveyor belt and from the belt back to the elevators.

5. In a parking garage having a main floor and another floor, a tier of elevators to convey cars from one floor to the other, a plurality of concentric turntables rotatably mounted on said other floor adjacent the elevators, said turntables each being adapted to hold cars thereon and having separate parking space segments radially provided thereon, each of said turntables except the innermost having one neutral segment lane, a conveyor belt rotatably mounted on said other floor adjacent and in front of the elevators between the elevators and the turntables, said turntables each being tangent to said con-

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veyor belt at one of the segmental spaces thereon, means separately to rotate the turntables to dispose the neutral lanes and the parking space segments selectively tangent to the conveyor belt, means to move the conveyor belt to move cars from in front of the elevators to in front of said tangential positions of the turntables, pushing and pulling hydraulic hook means to move cars from the elevators onto the conveyor belt and from the belt back to the elevators, and pushing and pulling hydraulic hook means to move cars from the conveyor belt onto the turntable and from the turntable back onto the conveyor belt.

6. In a parking garage having a main floor and another floor, a tier of elevators to convey cars from one floor to the other, a plurality of concentric turntables rotatably mounted on said other floor adjacent the elevators, said turntables each being adapted to hold cars thereon and having separate parking space segments radially provided thereon, each of said turntables except the innermost having one neutral segment lane, a conveyor belt rotatably mounted on said other floor adjacent and in front of the elevators between the elevators and the turntables, said turntables each being tangent to said conveyor belt at one of the segmental spaces thereon, means separately to rotate the turntables to dispose the neutral lanes and the parking space segments selectively tangent to the conveyor belt, means to move the conveyor belt to move cars from in front of the elevators to in front of said tangential positions of the turntables, pushing and pulling hydraulic hook means to move cars from the elevators onto the conveyor belt and from the belt back to the elevators, and pushing and pulling hydraulic hook means to move cars from the conveyor belt onto the turntable and from the turntable back onto the conveyor belt, said parking space segments having individual parking garages thereon with doors and separate locks for said doors.

References Cited in the file of this patent

UNITED STATES PATENTS

1,340,045	Hamilton et al.	May 11, 1920
1,418,714	Humphries	June 6, 1922
1,528,893	Rother	Mar. 10, 1925
1,582,099	Trask	Apr. 27, 1926
1,598,507	Robbins	Aug. 31, 1926
1,977,785	Wheelock	Oct. 23, 1934
2,028,476	Rome et al.	Jan. 21, 1936
2,204,023	Mason	June 11, 1940
2,229,776	Steinhorn	Jan. 28, 1941
2,675,134	Becker	Apr. 13, 1954

FOREIGN PATENTS

260,722	Great Britain	Nov. 11, 1926
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