

Oct. 20, 1959

J. J. SULLIVAN

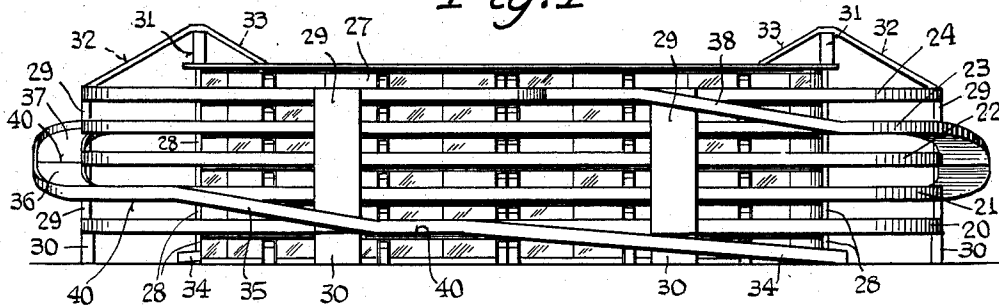
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STRUCTURE PROVIDING FOR VERTICALLY ARRANGED PARKING AREAS

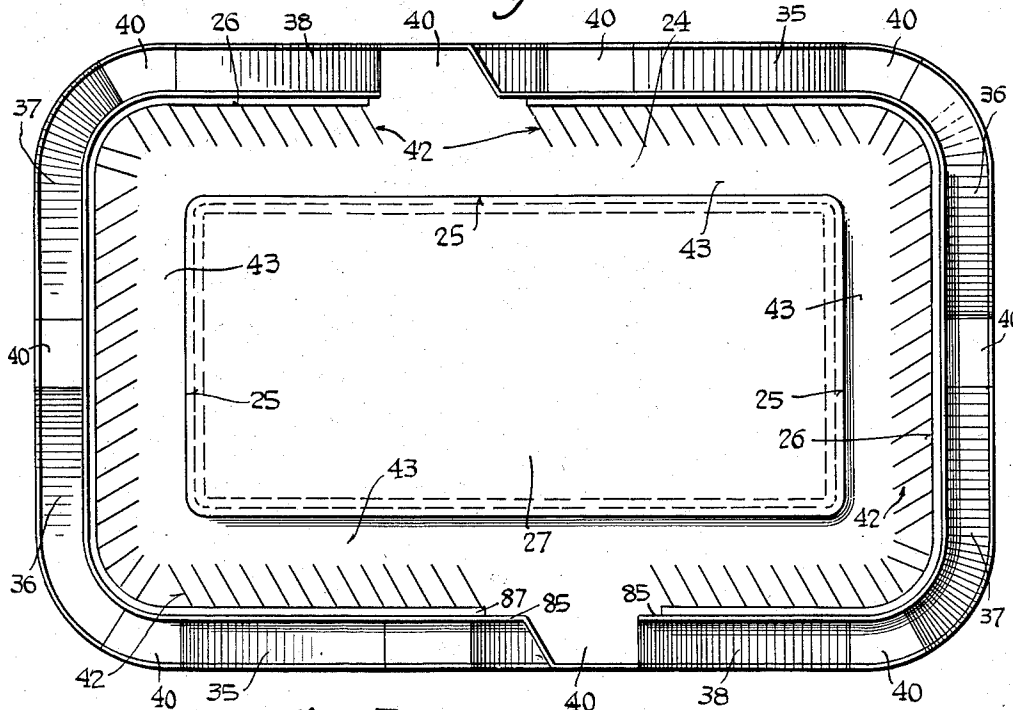
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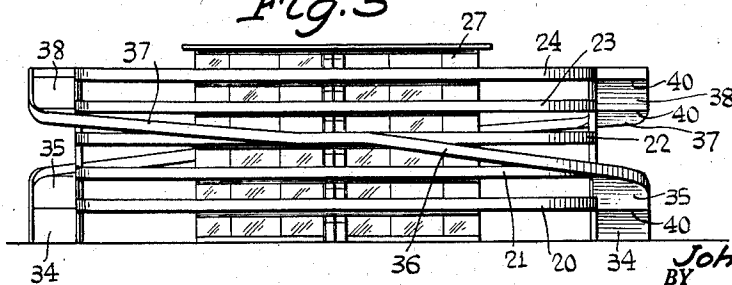
*Fig. 1*



*Fig. 2*



*Fig. 3*



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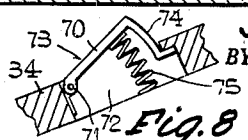
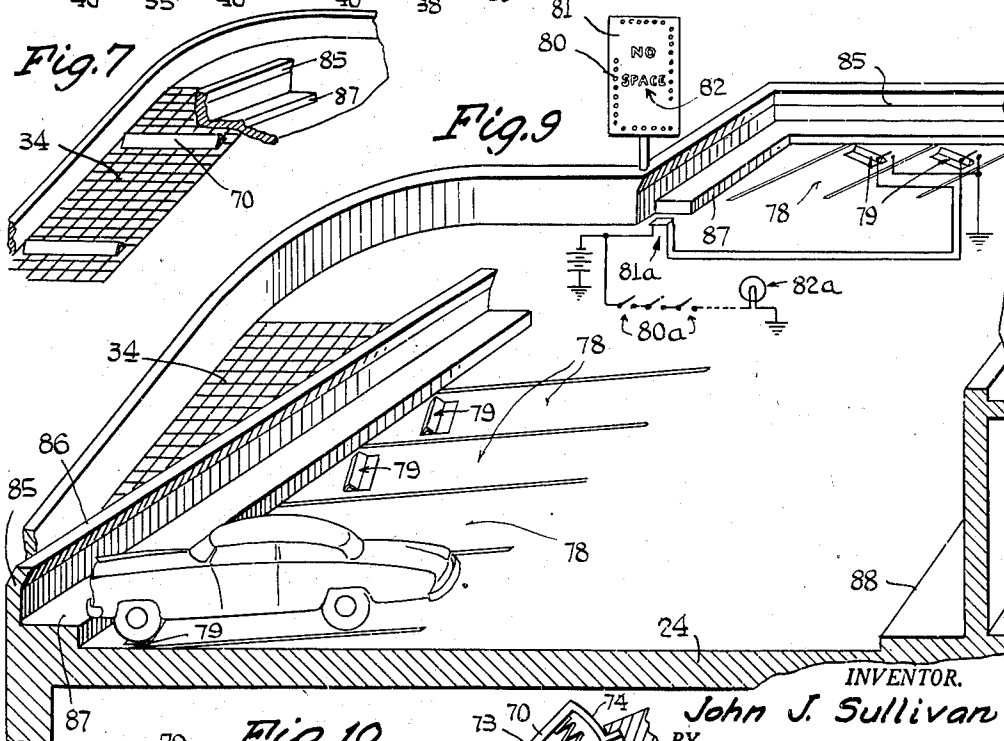
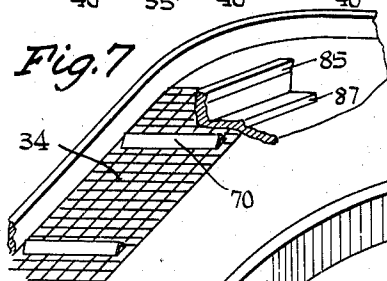
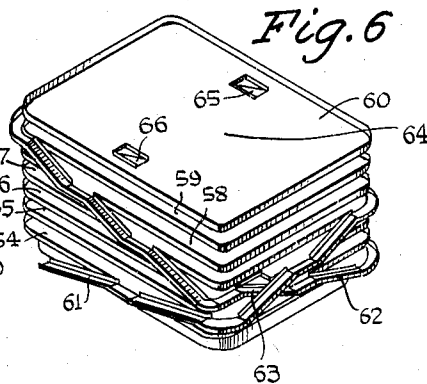
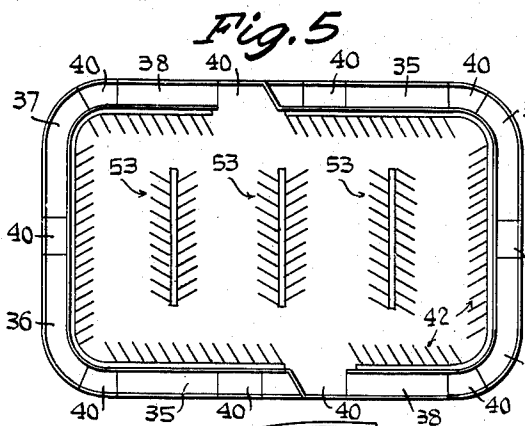
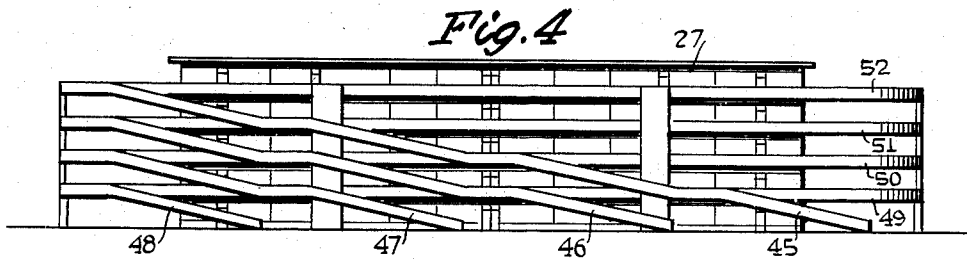
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STRUCTURE PROVIDING FOR VERTICALLY ARRANGED PARKING AREAS

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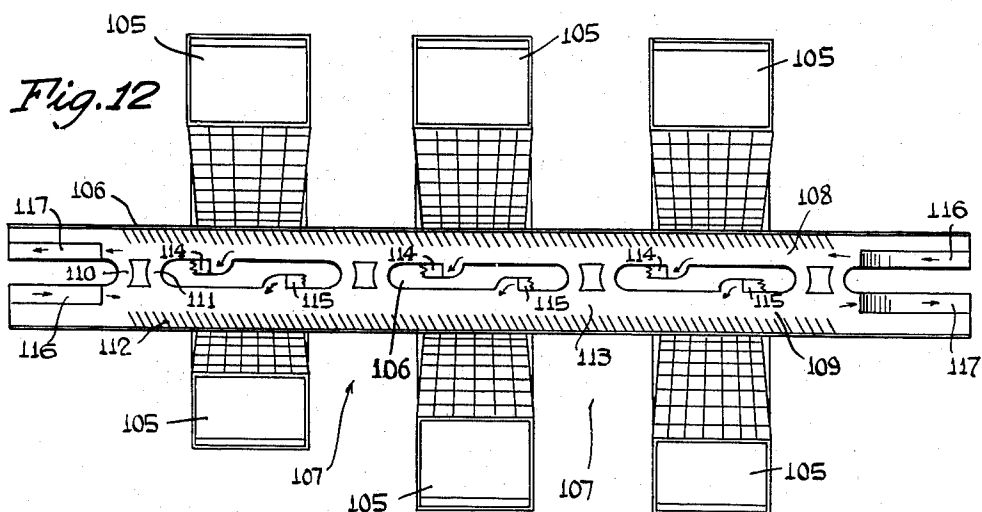
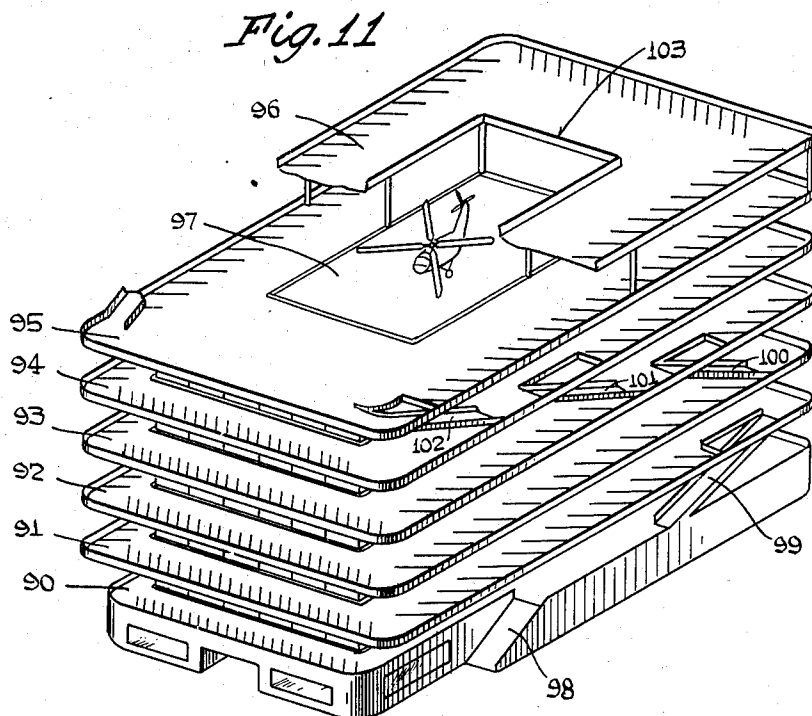
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STRUCTURE PROVIDING FOR VERTICALLY ARRANGED PARKING AREAS

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4 Sheets-Sheet 3



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## STRUCTURE PROVIDING FOR VERTICALLY ARRANGED PARKING AREAS

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Application May 6, 1955, Serial No. 506,608

5 Claims. (Cl. 20—1.13)

This invention relates to the parking of automobiles and other conveyances in congested areas such as cities, large towns or villages, either on parking lots or around multi-story office or industrial buildings.

Because of the widespread use of automobiles at the present time, together with the growth of cities and towns along lines which did not originally take into consideration the transportation problems of the future, there now exists a pressing problem concerning the traffic congestion of city streets and the use of automobiles for reaching desired destinations with a minimum of time and effort.

The traffic and parking problem has become so acute that great inconvenience is felt in the widespread use of vehicles which were originally intended to increase convenience and save time. In an effort to remedy the situation, parking lots have sprung up in the cities, and parking terminals, but this is at best a makeshift solution of an extremely important problem, since it does not make the fullest possible use of the factors of convenience provided by present day automobiles.

The present invention obviates the difficulties and disadvantages above mentioned, and solves completely and advantageously the transportation and parking problems now encountered in congested areas.

An object of the invention is to provide an improved parking structure which will greatly facilitate the parking of automobiles in congested areas, reduce the time and walking required to arrive at a desired destination, and greatly relieve traffic on city streets.

A further object of the invention is to provide an improved parking structure in accordance with the above, which will tend to greatly relieve the present load on passenger and freight elevators of commercial and industrial buildings located in congested areas.

A further object of the invention is to provide improved parking and transportation facilities which will speed the delivery of goods and materials to destinations in cities or other built-up areas.

Still another object of the invention is to provide an improved parking structure in accordance with the above, which may be applied or used in conjunction with multi-story buildings, or else as a complete self-contained unit in and of itself on a parking lot or area.

A feature of the invention resides in the provision of an improved parking structure which can utilize the space now existing over the sidewalks of city blocks, with a minimum of conversion and alteration of existing construction being required.

Another feature of the invention resides in the provision of a novel and improved parking structure as above set forth, which is arranged to extend completely around a city block having large commercial or business buildings, whereby any desired locations or destinations may be readily reached without recourse to appreciable walking along the surface, or use of elevators.

Still another object of the invention is to provide an

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improved parking structure in accordance with the above, which will advantageously supplement the present inadequate parking facilities, relieve traffic congestion, and tend to remove moving and stationary cars from already overcrowded streets.

Yet another object of the invention is to provide an improved parking structure as above, which is strong and sturdy, and structurally sound.

A still further object of the invention is to provide a parking structure in accordance with the above, which will result in a minimum of sidewalk and street congestion at the entrances and exits thereof.

An additional object of the invention is to provide a parking structure in accordance with the foregoing, which obviates the necessity for cars to cross sidewalks.

Another feature of the invention resides in the provision of an improved parking structure which is characterized by the ascending and descending ramps extending outside of the parking areas to minimize interference and congestion in parking, and to most efficiently utilize the space available and generally facilitate the parking operation.

Still another feature of the invention resides in the provision of an improved parking structure as above, characterized by a plurality of ramps to further facilitate arriving at the exact desired location from various different directions and to facilitate leaving the parking area for any desired destination without requiring appreciable maneuvering of the car which would tend to cause congestion or needless presence of cars in runway areas or streets.

A further feature of the invention resides in the provision of safety means whereby cars ascending ramps would be prevented from rolling backward, in the event of engine failure or the like.

A still further feature of the invention resides in the provision of novel and improved indicator means by which a driver may quickly and easily ascertain which parking areas are available.

Yet another feature of the invention resides in the provision of an improved parking structure in accordance with the above, which makes available additional show window and shop facilities not heretofore possible.

Another object of the invention is to provide an improved parking structure as above set forth, which is adaptable for use over the main thoroughfare of a town or village.

Yet another feature resides in the provision of novel tire bumpers and safety retaining walls, the tire bumpers being so arranged that they may be utilized as walks after the driver or occupants leave the car.

A still further object of the invention is to provide an improved parking structure for congested city areas, wherein any desired upper floor level of a commercial building can be reached directly and quickly, and the car readily parked at said level.

Other features and advantages will hereinafter appear. In the accompanying drawings:

Figure 1 is a front elevational view of a parking structure arranged in conjunction with a commercial or office building, in accordance with the invention.

Fig. 2 is a top or plan view of the parking structure and building shown in Fig. 1.

Fig. 3 is a left side elevational view of the parking structure and building shown in Fig. 1.

Fig. 4 is a front elevational view of a parking structure and building, illustrating another form of the invention.

Fig. 5 is a top or plan view similar to Fig. 2, but showing the roof of the building as being used to provide additional parking areas.

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Fig. 6 is a perspective view of a parking structure illustrating yet another modification of the invention.

Fig. 7 is a fragmentary view of an ascending ramp, showing the backcheck means provided by the invention, to prevent roll back.

Fig. 8 is a vertical sectional view taken through a portion of the ramp of Fig. 7, showing details of the backcheck means.

Fig. 9 is a view partly in vertical section and partly in perspective, showing a portion of the parking structure and the improved space indicator means provided by the invention.

Fig. 10 is a fragmentary vertical sectional view through a portion of the parking platform, showing a control means for use in conjunction with the space indicator of Fig. 9.

Fig. 11 is a perspective view of a parking structure and building cooperable therewith, wherein the roof of the building provides a landing means for aircraft, the upper portion of the parking structure constituting an enclosure for the aircraft parking area.

Fig. 12 is a view partly in plan and partly in perspective, showing the parking structure of the invention adapted for use over a city street lined with commercial buildings and having cross streets or intersections.

Fig. 13 is a vertical sectional view of the parking structure, illustrating another modification of the invention.

Fig. 14 is a fragmentary vertical sectional view of a parking structure, illustrating still another modification of the invention.

Referring to Figs. 1-3 the improved parking structure of the present invention comprises a plurality of platforms 20, 21, 22, 23 and 24 arranged one above the other in vertically spaced relation. In this embodiment of the invention the platforms 20-24, as seen in Fig. 2, have a configuration in the shape of a closed rectangular loop. The inner edges of the platforms 20-24 are indicated generally by the numeral 25, and the outer peripheral portions of all of the platforms indicated generally by the numeral 26. The platforms 20-24 may be arranged to encompass and extend around the front, back and sides of a commercial structure 27, which may comprise a plurality of office or industrial buildings or the like constituting an entire city block.

The inner edges 25 of the platforms 20-24 may be supported by the building structure 27 or may be supported by vertical pillars or posts 28 or both, while the outer peripheral or marginal portions 26 of the platforms may be connected with each other by vertical posts 29. The load carried by the outer marginal portions 26 and posts 29 may be assumed by vertical supports 30 extending from the lower platform 20 to the sidewalk or street, or as shown in outline it may be assumed by a truss structure comprising pillars 31 and tension members 32 and 33 engaged with the upper platforms 24 and with suitable anchorage means.

Further, in accordance with the present invention, I provide in conjunction with the platforms 20-24 exteriorly disposed ramps 34, 35, 36, 37 and 38 progressively connecting the platforms with the street level. Landing areas 40 are provided, by which cars ascending the ramps may drive onto any platform, or cars on any platform may drive onto any descending ramp. In Fig. 1 the series of ramps starting at the lower right portion of the building and extending across the left side of the building may be used for incoming cars, and the other series of ramps may be used for outgoing cars, or vice versa.

Referring to Fig. 2, each of the platforms 20-24 has marked, outer, marginal, obliquely-disposed parking areas 42 and inner driveway areas 43.

Cars entering any of the platforms 20-24 will proceed along the driveway area in a clockwise direction as

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viewed in Fig. 2 and may park at any vacant area nearest to the desired destination, since all platforms are available to the cars and all sides of the building also available.

Thus, by the present invention, I provide a parking structure by which the driver or occupants of the car may ascend to any desired floor level on any street of a city block and park virtually at the door of the establishment desired. It will be appreciated that a great convenience is thereby provided, and a saving of time since there is required but a minimum of walking. Congestion on the city streets is greatly relieved, speeding up the normal flow of traffic, and large new areas are made available for the parking of automobiles. It will be noted that at no time is it necessary for the automobiles to cross a sidewalk, or for the driver or occupants to cope with street traffic or to use the elevator facilities of the building, unless desired for other purposes or necessary due to filled-up space. Normally, use of elevators in the above parking construction will be decreased, if anything.

Each floor of the building structure may be provided with the necessary entrance and exit doors, and may advantageously have show windows for the display of merchandise. Accordingly, there is multiplied many times the available show window space and store area, for any given locale in the city. Where deliveries are to be made, the same convenience applies. Deliveries are greatly speeded up, and the load and congestion of freight and passenger elevators minimized.

Due to the open nature of the parking platforms, adequate light and air is available, and the natural light may be supplemented by modern-day lighting equipment which has been found of such great advantage for display and other purposes.

The flow of traffic on the parking platforms is even and uninterrupted since no intersections exist, and since it is not necessary for the paths of the cars to cross at any time. Thus the destination may be arrived at rapidly and conveniently, with the minimum of confusion, and departure will be characterized likewise.

A modification of the invention is shown in Fig. 4, wherein a larger number of entrance and exit ramps is provided. As shown in this figure, four series of ramps 45, 46, 47 and 48 may be provided where it is considered advantageous to more quickly handle the volume, in greatly congested areas. The ramps 45-48 are supported on the outer peripheral portions of parking platforms 49, 50, 51 and 52, as described above in connection with Figs. 1-3.

In Fig. 5 there is shown a construction wherein the roof area of the building 27 may be utilized for additional parking facilities, by the provision of obliquely marked parking areas 53, as shown. In such event an additional platform would be provided, located above the uppermost platform 24 of Fig. 1, with additional ramps communicating thereto.

Another modification of the invention is shown in Fig. 6, wherein a parking structure is pictured having parking platforms 54, 55, 56, 57, 58, 59 and 60, serviced by an ascending series of ramps 61 and a descending series of ramps 62. The series of ramps 61 and 62 cross each other as indicated, a ramp 63 of the series 62 extending through an outer marginal portion of the parking platform 56 as shown. Exit from and entrance to the top area 64 of the parking structure may be had by ramps 65 and 66, connected with recessed areas as shown.

By the present invention I provide novel and simplified backcheck means on the ascending ramps, to prevent roll-back of cars in the event of engine failure or the like. Referring to Figs. 7 and 8, the ascending ramp 34 is provided with a plurality of transversely-extending check members 70 mounted, by means of pivots 71, in recesses

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72 in the ramps. The members 70 are movable between extended positions as shown in Fig. 8 and retracted positions wherein they are flush with the upper surface of the ramp. When extended, the members 70 have sloping surfaces 73 facing the lower end of the ramp, and abutting surfaces 74 facing the upper end of the ramp. Compression springs 75 normally hold the back check members 70 in projected positions. When an automobile passes up the ramp it will depress the members 70 and as the wheels pass over the members they will again become projected, providing an obstruction in the event that the car tends to roll backwards. The members 70 are spaced apart a distance commensurate with the average wheel base dimension of automobiles, to effect a combined checking action.

By the present invention I provide a novel indicator means by which a driver may readily ascertain what parking spaces are available to him. Referring to Figs. 9 and 10, the parking areas 78 are provided with wheel-engageable switch members 79 which are connected with lights or other signals 80 on an indicator board 81. The signals 80 are arranged in the same geometrical configuration as the parking spaces 78, and when a parking space 78 is occupied, the corresponding signal 80 will be actuated, so indicating. When all of the parking areas 78 are occupied a sign 82 "No Space" will be illuminated, indicating that all of the areas on this floor level are occupied. The signals 80 may be magnetically actuated arms behind openings in the board, and may control series-connected switches 80a controlling a bulb 82a as shown in the diagram of Fig. 9, said bulb lighting the sign "No Space." In this diagram the conduit outlet is shown at 81a.

By the present invention I provide a novel, outer safety wall 85 having an inturned upper edge or rim 86, in conjunction with a front tire bumper 87 by which there is prevented any possibility of an automobile which is being parked catapulting over the edge of the platform. The tire bumper 87 comprises a raised platform surface, and along the inner edges of the platforms I provide a rear tire bumper 88 which may be used as a walk by people, for the convenience of persons entering or leaving the parking area.

Another embodiment of the invention is shown in Fig. 11, wherein parking platforms 90, 91, 92, 93, 94, 95 and 96 are disposed around a building 97 in vertically spaced relation. Upgoing ramps 98, 99, 100, 101 and 102 are provided, passing through outer marginal or peripheral portions of the platforms 90-96, to provide for ingress and egress of cars. The uppermost platform 96 is disposed above the top of the building 97, and its inner edge 103 defines a rectangular court, providing for access to the building top 97. Thus there is provided a convenient landing space for helicopters or like aircraft. All of the advantages attendant my improved platform parking structure as described above are found in the structure of Fig. 11.

Platform parking in accordance with this invention may be readily adapted to the main thoroughfare of a town or village, as shown in Fig. 12. In this figure industrial or commercial buildings 105 may line the thoroughfare 106 and also intersecting streets 107. A plurality of sets of parking platforms 108 and 109 may be provided, in vertically spaced relation, extending along opposite sides of the thoroughfare 106 juxtaposed to the buildings 105. The platforms 108 and 109 may be advantageously supported by the buildings and also by suitable vertical columns as shown in the construction of Fig. 1. The platforms 108 and 109 may be interconnected by driveways 110 and 111 to provide for U-turns, the marginal portions of the platforms located nearest to the buildings 105 having obliquely marked parking areas 112 and the other marginal portions 113 of the platforms being arranged for driveways or thoroughfares. Up ramps 114 and down ramps 115 may be provided, enabling cars to pass from

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platforms at lower levels to upper level platforms, and vice versa. At the ends of the platforms 108 and 109 up and down ramps 116 and 117 may be provided as shown.

Thus large areas are made available for parking above the street and sidewalk surfaces, which areas heretofore have not been utilized for this purpose.

Another embodiment of the invention is shown in Fig. 13. Parts similar to those already described in Fig. 1 have been given like characters. In Fig. 13 the marginal portions of the platforms 20-24 which the ramps 34, 36 are in turn supported by posts 29 and 30, and the opposite marginal portions of the platforms 20-24 are supported by posts or columns 120 instead of by a building structure. Stairs 121 are provided opposite the ramps, leading from one platform to another, and tire bumpers 122 providing walks extend along the marginal portions at which the stairs 121 are located.

Another embodiment of the invention is shown in Fig. 14. This is similar to the structure of Fig. 13 except that the lowermost ramp 34a has been shifted to the right, being disposed between the side marginal portions of the lowermost platform 20. The ramp 34a may extend a distance into the sidewalk 125, so that the curb 126 thereof lies midway between the ramp as indicated by the dotted outline. Supporting columns 127 may be provided at the curb 126 to carry the load of the outer portions of the platforms 20-24. By this means congestion and stoppage of traffic on the street 128 may be avoided, with little tendency to congestion of pedestrian traffic on the walk 125.

Variations and modifications may be made within the scope of the claims and portions of the improvements may be used without others.

I claim:

1. The combination with a thoroughfare for automobiles having street intersections and commercial buildings disposed along said thoroughfare and street intersections, of a parking structure comprising a plurality of elongate platforms extending along both sides of the thoroughfare and disposed one above another in vertically spaced relation, side marginal portions of said platforms being connected with said building structures for support thereby; ramps leading up and down, connected to the extremities of the lowermost platforms; ramps leading up and down connected with the juxtaposed outer marginal portions of the platform whereby an automobile may ascend to or descend from any platform; and driveways disposed at intervals along and between said platforms, said driveways interconnecting platforms which are located at the same levels.

2. A structure for parking automobiles, comprising a plurality of open platforms disposed one above the other in substantially vertical array, each platform comprising a closed loop; means comprising a building structure adapted for occupancy, attached to the inner edges of said platforms for supporting the same in vertically spaced relation; a plurality of pillars extending upward and engaging outer peripheral portions of the platforms, for supporting the same; open, sloping ramps disposed externally of the platforms and extending progressively from the lower to the upper platforms, said ramps being supported by the outer peripheral portions of the platforms; landings connecting the ramps with the platforms, to provide for ingress and egress of cars to and from the platforms via the said ramps; and additional ramps extending from the lowermost platform to the street level, said additional ramps being disposed between the inner edges and the outer peripheral portions of the lower platform and being offset inwardly from the first-mentioned ramps; horizontal passages at the level of the lower platform, extending from the upper ends of said additional ramps to the lower ends of the next higher ramps which connect the lowermost and the next higher platforms.

3. A structure for parking automobiles, comprising a plurality of open platforms disposed one above the other

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in substantially vertical array, each platform comprising a closed loop; means comprising a building structure adapted for occupancy, attached to the inner edges of said platforms for supporting the same in vertically spaced relation; a plurality of pillars extending upward and engaging outer peripheral portions of the platforms, for supporting the same; open, sloping ramps disposed externally of the platforms and extending progressively from the lower to the upper platforms, said ramps being supported by the outer peripheral portions of the platforms; landings connecting the ramps with the platforms, to provide for ingress and egress of cars to and from the platforms via the said ramps; additional ramps extending from the lowermost platforms to the street level, said additional ramps being disposed between the inner edges and the outer peripheral portions of the lower platform and being offset inwardly from the first-mentioned ramps; horizontal passages at the level of the lower platform, extending from the upper ends of said additional ramps to the lower ends of the next higher ramps which connect the lowermost and the next higher platforms, said building structure being disposed within the platforms and being of rectangular configuration; and a sidewalk surrounding the building structure below the lowermost platform, said sidewalk having curb portions extending in lines which lie between the side edges of the said additional ramps.

4. A structure for parking automobiles, comprising a plurality of open platforms disposed one above the other in substantially vertical array, each platform comprising a closed loop; means comprising a building structure adapted for occupancy, attached to the inner edges of said platforms for supporting the same in vertically spaced relation; a plurality of pillars extending upward and engaging outer peripheral portions of the platforms, for supporting the same; a plurality of sets of open, sloping ramps disposed externally of the platforms and extending progressively from the lower to the upper platforms, said ramps being supported by the outer peripheral portions of the platforms; a plurality of sets of landings connecting the ramps with the platforms, to provide for ingress and egress of cars to and from the platforms via the said ramps; additional ramps extending from the lowermost platforms to the street levels, said additional ramps being disposed between the inner edges and the outer peripheral portions of the lower platform and being offset inwardly from the first-mentioned ramps; horizontal passages at the level of the lower platform, extending from the upper ends of said additional ramps to the lower ends of the next higher ramps which connect the lowermost and the next higher platforms, said building structure being disposed within the platforms and being of rectangular configuration; and a sidewalk surrounding the building structure below the lowermost platform, said sidewalk having curb portions extending in lines which lie between the side edges of the additional ramps, said sets of ramps being disposed at different locations and said sets of landings being disposed at different locations and providing a plurality of entrances and exits to and from each platform, the lowermost ramps of the sets being disposed on different streets bordering the said building structure.

5. A structure for parking automobiles, comprising a plurality of open platforms disposed one above the other in substantially vertical array, each platform comprising

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a closed loop; means comprising a building structure adapted for occupancy, attached to the inner edges of said platforms for supporting the same in vertically spaced relation; a plurality of pillars extending upward and engaging outer peripheral portions of the platforms, for supporting the same; a plurality of sets of open, sloping ramps disposed externally of the platforms and extending progressively from the lower to the upper platforms, said ramps being supported by the outer peripheral portions of the platforms; a plurality of sets of landings connecting the ramps with the platforms, to provide for ingress and egress of cars to and from the platforms via the said ramps; additional ramps extending from the lowermost platforms to the street level, said additional ramps being disposed between the inner edges and the outer peripheral portions of the lower platform and being offset inwardly from the first-mentioned ramps; horizontal passages at the level of the lower platform, extending from the upper ends of the said additional ramps to the lower ends of the next higher ramps which connect the lowermost and the next higher platforms, said building structure being disposed within the platforms and being of rectangular configuration; and a sidewalk surrounding the building structure below the lowermost platform, said sidewalk having curb portions extending in lines which lie between the side edges of the said additional ramps, said sets of ramps being disposed parallel to each other in vertically spaced relation and at different locations and providing a plurality of entrances and exits to and from each platform, the said additional ramps being disposed on different streets bordering the said building structure and at least two of the said additional ramps being disposed on a single street bordering the building.

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