SEARCH ROOM

Sept. 21, 1954 P. H. BURN 2,689,384

GARAGE

Filed April 2, 1948 3 Sheets-Sheet 1

FIG. 1.

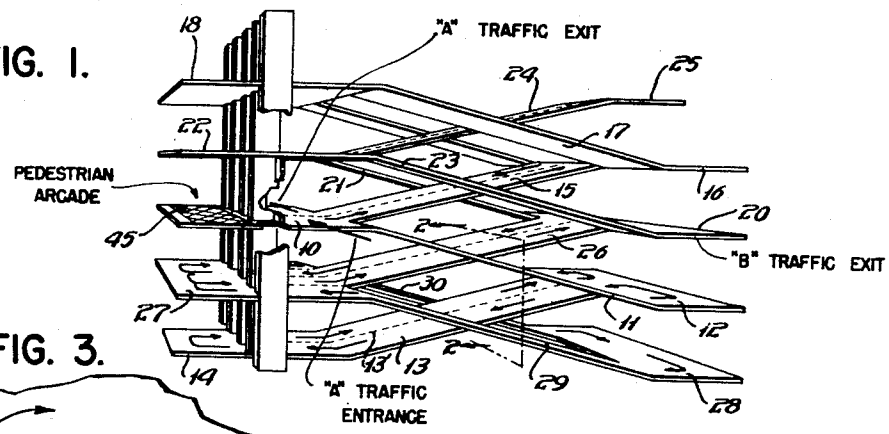


FIG. 3.

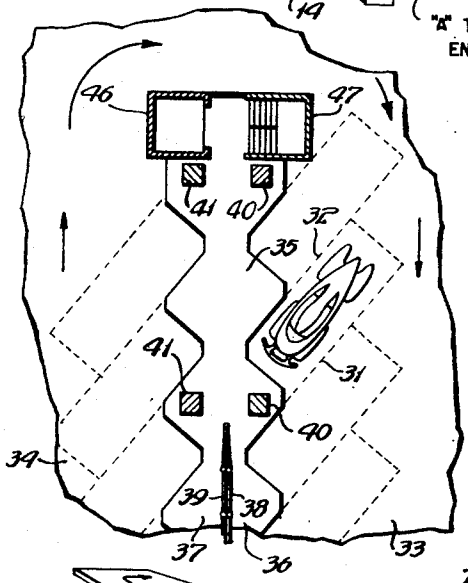
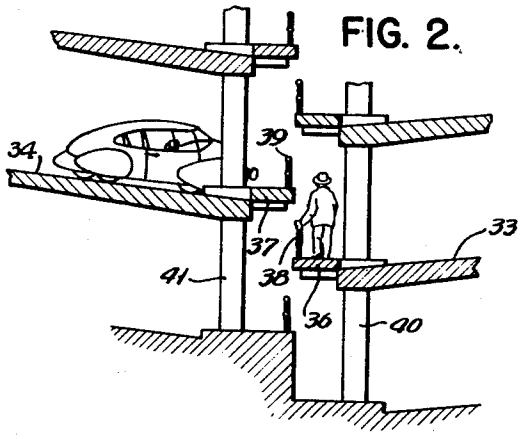


FIG. 2.



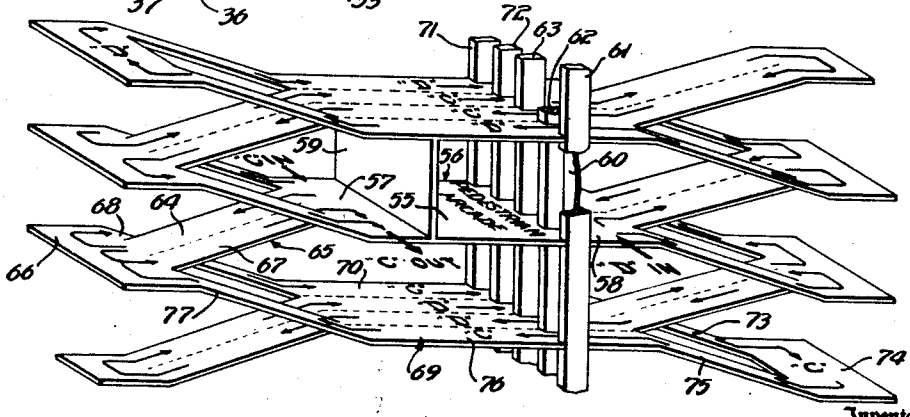


FIG. 5.

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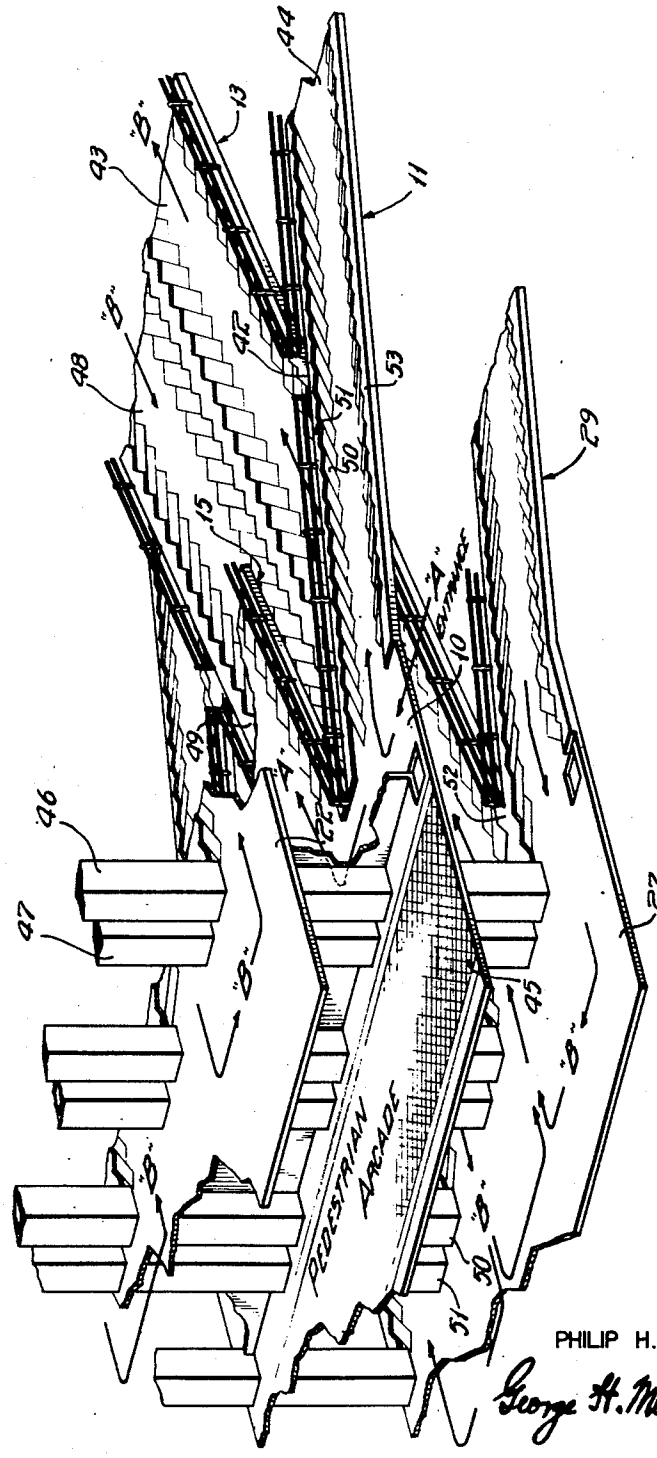
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GARAGE

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FIG. 4.



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GARAGE

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FIG. 6.

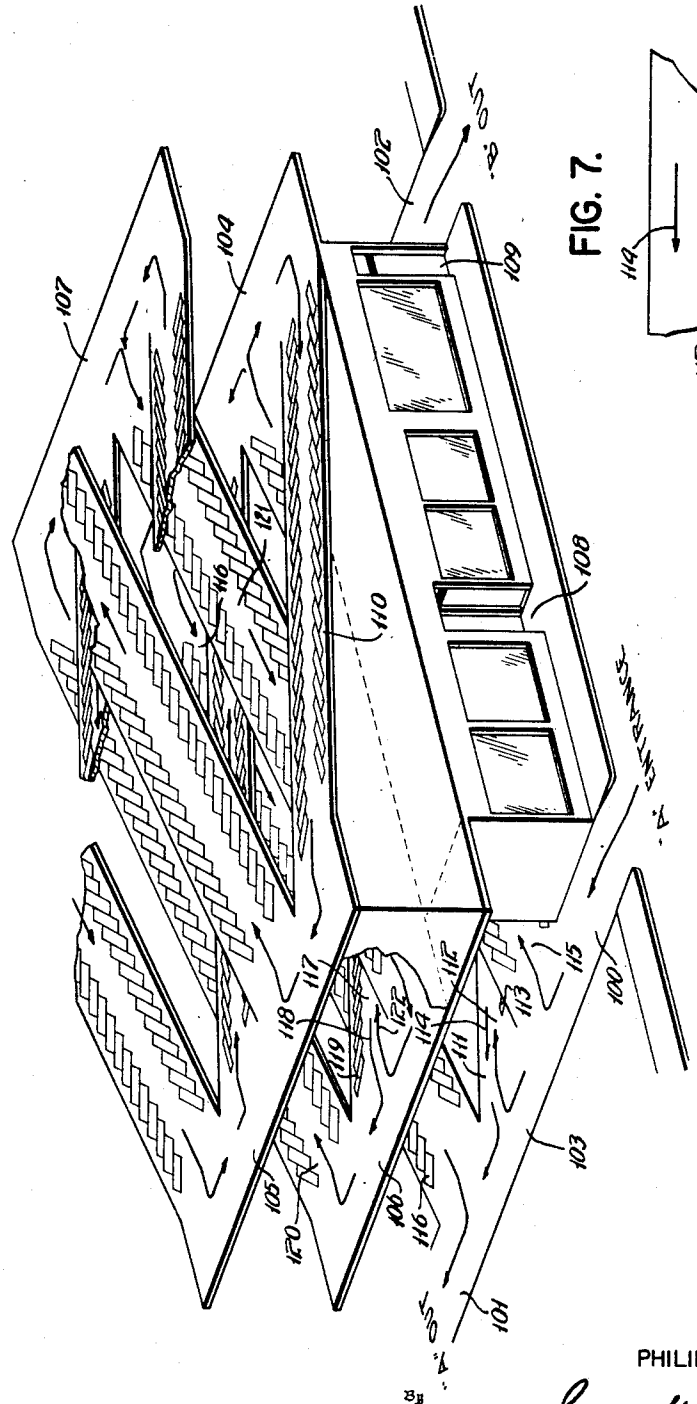
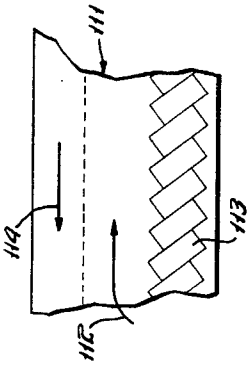


FIG. 7.



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UNITED STATES PATENT OFFICE

2,689,384

GARAGE

Philip H. Burn, Forest Hills, N. Y.

Application April 2, 1948, Serial No. 18,639

4 Claims. (Cl. 20—1.13)

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My invention relates to garages and in particular to improved means for efficiently utilizing a given space for vehicle-parking purposes. The invention is particularly useful in application to garages of the character disclosed in my copending patent application Serial No. 709,769, filed November 14, 1946, now Patent No. 2,482,610 issued September 20, 1949, and in the Burn et al. patent application Serial No. 661,964, filed April 13, 1946, now Patent No. 2,659,109, issued November 17, 1953.

The present application is a continuation-in-part of the aforesaid applications.

It is an object of my invention to provide an improved arrangement of the character indicated.

It is also an object to provide improved means for assuring safety to the individual pedestrian within a garage of the character indicated.

It is another object to provide an improved garage that may include provision for a space allocation to stores and other commercial enterprises on the street and on such other levels as may be desired, without in any way affecting the pedestrian safety and freedom of traffic flow that is characteristic of my garages.

It is a specific object to meet the above objects with a garage in which there may be a free flow of vehicular traffic throughout and in which pedestrians may readily gain access to any parking space without crossing a lane of vehicular traffic.

Other objects and various further features of the invention will be pointed out or will occur to those skilled in the art from a reading of the following specification in conjunction with the accompanying drawings. In said drawings, which show, for illustrative purposes only, preferred forms of the invention:

Fig. 1 is a schematic perspective view of a garage structure incorporating features of the invention;

Fig. 2 is an enlarged fragmentary sectional view, as might be obtained substantially in the plane 2—2 of Fig. 1;

Fig. 3 is an enlarged fragmentary plan view illustrating my novel utilization of space between adjacent traffic lanes of the garage of Fig. 1;

Fig. 4 is a partly broken-away fragmentary isometric view of the garage of Fig. 1;

Fig. 5 is a schematic isometric view generally similar to Fig. 1 but illustrating application of the principles of my invention to another garage arrangement; and

Fig. 6 is a partly broken-away isometric view of still another garage arrangement according to the invention.

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Fig. 7 is a detail view in plan with parts broken away of a ramp.

Briefly stated, my invention contemplates the provision in a garage of means whereby a pedestrian may proceed to any point within the garage to gain access to a particular parked vehicle, without at any time crossing a lane of vehicular traffic in the garage. The pedestrian access thus afforded may, in addition to being the safest route, also prove to be the most direct, that is, the shortest route, to any particular parked vehicle. In the garage structure to be described, substantially all parking of vehicles is accommodated on one or both sides of each of a number of traffic lanes, and the traffic lanes are on ramps sloping upwardly and downwardly from and to a number of landing tiers at the ends of ramps. At one particular level, say at the street level, one of the landings includes a pedestrian arcade which may extend substantially the combined width of all ramps communicating with said one landing. Pedestrian passages such as stairs or elevators may communicate directly from said one landing to the spaces between the parked vehicles of adjacent traffic lanes. Spaces within the pedestrian arcade may be used for commercial purposes, such as newspaper and and novelty stores, and space occupied by one or more of the ramps near the street level may be similarly utilized, as for retail or the like stores.

Referring to Figs. 1 through 4 of the drawings, my invention is shown in application to what I term an all-ramp garage, which may be of the type disclosed in more detail in the above-identified copending patent application of Burn et al. In this type of garage, substantially all parking of vehicles may be accommodated on either or both sides of the traffic lanes of upwardly and downwardly sloping ramps, which may extend substantially the length of the building. In the form shown, the ramps communicate at each end with a number of landings one above another. It will be understood that proportions have been foreshortened because of space limitations in the drawings.

The particular garage shown provides for two independent systems of traffic routing, with separate entrance and exit facilities for each of said systems. For identification purposes, the two systems are labeled System "A" and System "B." The garage structure is such that it may be conveniently sandwiched between two consecutive parallel streets, so that the entrance for "A" traffic may be from one of said streets and so that the exit from "A" traffic may be into the

other of said streets. In like manner, the entrance to "B" traffic may be from said other street ("B"-traffic entrance not labeled), and the "B"-traffic exit may be into the first of said streets.

In the form shown, the entering and leaving traffic in System "A" first utilizes a traffic arcade 10 on a first landing at the left end of the garage structure; this arcade 10 may provide access to downwardly routed traffic, say on the slope 11 (on the near side as shown in Fig. 1), to a landing 12 at the right end of the garage structure. The landing 12 may provide access to a downwardly directed traffic lane on the ramp 13 or to another upwardly sloping traffic lane (on the far side as shown in Fig. 1) in substantially the same plane as the ramp 11 to communicate again with the entrance landing on arcade 10. In the form shown, the ramp 13 is of width sufficient to accommodate two adjacent traffic lanes, as suggested by the dashed line 13'. Downwardly directed traffic on ramp 13 may proceed to a basement landing 14, which may provide means for turning around in order to gain access to the adjacent upwardly directed traffic lane on ramp 13 and to return to the landing 12.

Alternatively, motorists using the "A"-traffic system may proceed upwardly via a double-width ramp 15 accommodating two adjacent traffic lanes. Using the upwardly directed one of these lanes, access may be had to a landing 16 at the right end of the building, where there is the option to proceed downwardly on ramp 15 toward the "A"-traffic exit or to proceed further upward on the traffic lane of the ramp 17, which in turn communicates with an upper landing 18.

The ramps and landings utilized for the routing of "B" traffic may be generally similar in disposition to the ramps 13—11—15—17 and landings 14—10—18 and 12—16 which have been described for the "A" system. Thus "B" traffic may enter and leave on a landing 20 at the right end of the garage structure and proceed upwardly via a ramp 21 to a landing 22 at the left end of the building. From landing 22 there is the option to proceed downwardly on ramp 23 in order to regain the entrance-exit landing 20 or to proceed upwardly on a ramp 24 to an upper landing 25. The ramp 24 may be of double width, that is of width to accommodate two adjacent traffic lanes, as in the case of the ramps 13 and 15 which are directly beneath the ramp 24. Downwardly directed "B" traffic from landing 20 may utilize a double-width ramp 26 to a landing 27, which in turn may have access to a basement landing 28 via a down ramp 30 and an up ramp 29.

In a preferred arrangement, each traffic lane is lined on both sides with obliquely inclined parking rectangles, such as the rectangles schematically indicated in Fig. 3 by the dotted lines 31—32. Between the parking rectangles of one traffic lane 33 and the adjacent parking rectangles of the adjacent traffic lane 34 provision may be made for a pedestrian walk or path 35; and when, as in the case of the traffic lanes 33—34, the slopes of the adjacent traffic lanes diverge, the path 35 may divide into independent walks, such as the walks 36—37. The walks 36—37 may be guarded by separate railings 38—39 and provide access to all parked vehicles along the adjacent sides of the traffic lanes 33—34. For structural purposes, supporting columns 40—41 may be placed to pass through the walks 35—36—37 in non-interfering relation with the parked vehicles or with the occasional pedestrian traffic that is to be expected along the walks.

It will be understood that the described arrangements of walks, of supporting columns, and of railings when needed, may be applied throughout the garage of Fig. 1 for the case of all traffic lanes, whether the traffic lanes are adjacent on the same ramp or adjacent on adjacent ramps. Where adjacent ramps cross, that is, where they may be said to intersect in a vertical projection, communicating passages or openings, such as the passage 42 (see Fig. 4) between the walks of traffic lane 43 and of traffic lane 44, may provide ready pedestrian flow between the different slopes.

In accordance with a feature of the invention, I provide relatively simple means whereby pedestrians may have relatively quick, and at the same time the safest possible, access to any particular parking space, regardless of its location in the garage. Such access may be gained by the provision of a pedestrian arcade 45 which may share the same landing as that employed by the traffic arcade 10 utilized for "A"-traffic entrance and exit facilities. The pedestrian arcade 45 may communicate directly with various walks (such as the walk 35) between adjacent traffic lanes (such as the lanes 33—34) by utilizing a number of generally vertically extending passages running directly from the arcade 45 to the paths. In the form shown see Figs. 3 and 4), I have provided duplicate means of access in the form of duplicate columns such as the columns or shafts 46—47 for access at successive levels to adjacent paths of ramps 13, 26—29, 15—11, 24—23, and 17, respectively. One of these shafts, say the shaft 46, may accommodate an elevator and the other shaft, say the shaft 47, may accommodate a stairway.

At all floor levels other than the street or pedestrian-arcade level, the path (e. g. path 35) between traffic lanes is preferably extended as far as the elevator and stairway shafts 46—47, thus providing additional space for parking on the various landings and at the same time assuring absolute safety in the matter of pedestrian access to parked vehicles. At all these other floor levels, therefore, traffic proceeding from one traffic lane (34) to an adjacent traffic lane (33) may be routed around the columns or shafts 46—47, thus utilizing the space over and below the pedestrian arcade 45.

It will be noted that but one pedestrian arcade need be provided for the garage of Fig. 1 even though two independent traffic-routing systems (System "A" and System "B") may be incorporated in a single garage. Both systems "A" and "B" utilize landings (14—27—10—22—18) at the arcade end of the building and are, therefore, both served by the arcade 45 and by pedestrian passage means such as the elevators and stairways of the shafts 46—47. If a motorist using the "B"-traffic system were to park, say, on the downwardly directed lane 48 of ramp 26 (see Fig. 4) and on the right-hand side, he could utilize the walk 49 to proceed downwardly to the landing 27, where he could obtain elevator service in the shaft 50 or he could use the stairway in the shaft 47 to reach the pedestrian arcade 45 for safe exit from the building. At no time need he cross a lane of traffic within the garage. The only time when a motorist might be said to be in any way inconvenienced by my system of paths and passages would be say the case of parking a vehicle close to the entrance or exit and away from the street side of the building. Take for example a vehicle entering the "A"

system and proceeding on ramp 11 to park on the left side of the lane 44, as at the rectangle 50. The safest pedestrian exit would involve use of the path 51 to the cross-over 42, and thence via the path 52 to the elevator and stairway shafts 46—47, even though the distance traversed may be greater than that involved in walking across the traffic lane 44 to the walk 53 which may open directly to the street or side walk.

In Fig. 5, I show an application of the principles of my invention to another ramp-type garage structure, which is schematically shown somewhat foreshortened for purposes of clarity. It will be understood however, that in a preferred arrangement grading on the various ramps may involve gentle slopes of the order of 6% or less. In the arrangement of Fig. 5, a single pedestrian arcade 55 is located centrally of the garage and serves two independent traffic-routing systems, which again may be lined with parking rectangles as in the case of systems "A" and "B" of Fig. 1; the two systems of Fig. 5 are labeled System "C" and System "D." Both systems may have independent exit and entrance facilities at the street level. In the form shown, a central landing 56 serves the triple purpose of providing for the pedestrian arcade 55, for an entrance-exit arcade 57 in the "C" system of traffic routing, and for a similar entrance-exit arcade 58 in the "D" system of traffic routing. A barrier 59 may serve to separate the traffic arcade 57 from the pedestrian arcade 55, and a barrier 60 may similarly separate the pedestrian arcade 55 from the traffic arcade 58. Substantially vertically extending shafts 61—62—63—71—72 may be provided on one side of the arcade 55 for elevator or stairway communication to walks on the various ramps and floor levels in much the same manner as has been described for Fig. 1.

In the garage of Fig. 5 both of the independent traffic routing systems "C" and "D" may be said to be interlaced with one another, for they may each utilize both ends of the garage. Incoming traffic for System "C," for example, may proceed down one traffic lane 64 of a double-width ramp 65 to a landing 66 at the left end of the building. The option then presented is to turn around and proceed up via the traffic lane 67 to the arcade 57 for exit. Proceeding downwardly from the landing 66, as on the down-ramp 68, access is gained to a lower central landing 69 which may be of essentially the same horizontal projection as the landing 56. However, in the form shown, "C" traffic proceeds along landing 69 in a traffic lane 70 between shafts 71 and 72 to another down-ramp 73 at the right end of the building. The ramp 73 is shown to communicate with a basement landing 74 and thence to another ramp 75 of the same slope as ramp 73. From ramp 75, access is again gained to the central landing 69, this time utilizing another traffic lane 76 which leads into an up-ramp 77 and back to the landing 66. Access to other floor levels may be in generally the same relatively simple manner, and in no case need vehicular traffic of the two independent traffic routing systems intersect. When there is an intersection within either one of the systems "C" and "D," the direction of intersecting traffic will be understood to be such as not to produce congestion.

As indicated generally above, I prefer that the independent traffic lanes of the garage of Fig. 5 be flanked by space for parking and that between adjacent parking rows there be walks generally similar to those shown in detail in Figs. 2, 3, and 4. All walks may clearly communicate with one or another of the pedestrian shafts 61—62—63—71—72, for shortest possible passage to the street via the pedestrian arcade 55, as will be clear.

In accordance with a further feature of the invention, I provide a means whereby part of the space within a garage of the all-ramp type described above may be devoted to commercial purposes, without destroying or inhibiting the free flow of traffic or the ease of pedestrian access inherent in the described system. An all-ramp garage so modified is shown in Fig. 6, and for clarity I have omitted the pedestrian walks which have been described above. In the simplified diagram of Fig. 6, I show a two-route all-ramp garage comprising two essentially independent systems of traffic routing. An "A"-traffic entrance 100 is at the level of one street, and the "A"-traffic exit is at the same level at 101 into another street. The "B"-traffic entrance is not shown but will be understood to be from the second-mentioned street, and the "B"-traffic exit is at 102 into the first-mentioned street. As with other described arrangements, the "A"-traffic system may utilize at least one slope for two-way traffic to communicate with each of a plurality of floor landings 103—104—105. In like manner, the "B"-traffic system may employ corresponding slopes handling two-way traffic communicating between landings at levels 102—106—107.

In accordance with the invention, the space occupied by one of the ramps adjacent a street may be devoted to commercial uses, and this space may extend upward or downward for any desired number of floors. In the form shown, stores having entrances 108—109 to the street and having extensive display windows may be built into the volume between ramp 110 and the corresponding ramp (not shown) below the street level. It will be understood that if desired, these stores could be extended vertically to include the volume between any desired number of vertically stacked ramps including the ramp 110.

In order that the garage of Fig. 6 may accommodate the same free flow of traffic which is characteristic of the previously described arrangements, I provide for a two-way flow of traffic in one of the ramps which were formerly restricted to one lane of traffic. Thus, the down-ramp 111 which communicates with the entrance-exit landing 103 for system "A" may accommodate two-way traffic: on the one hand, a downwardly directed lane 112 which may have parking rectangles 113 on the side thereof and, on the other hand, an upwardly directed traffic lane 114 in place of the space which might otherwise have been devoted to a row of parking rectangles. The other two ramps or traffic lanes 115—116 communicating with landing 103 may be of the same width as that of ramp 111 but each need only handle a single direction of traffic, as indicated by arrows. Since these ramps 115—116 handle but one direction of traffic flow, parking rectangles may be provided on opposite sides in the manner discussed more fully above.

It will be understood that, however high the commercial property may be caused to extend, the basic garage structure of Fig. 6 lends itself to ready modification in order to handle independent flow of traffic of plural systems "A" and "B," but that for floor levels above and below the store space the garage system may be identical with those previously described. For ex-

ample, traffic proceeding in system "A" upward on ramp 115 may have the option of parking on both sides of ramp or traffic lane 115 or of proceeding to the landing 104. If exit is desired, a left turn on landing 104 will give access to ramp 116 where there again may be double rows of parking rectangles, and access is direct to the exit 101. Alternatively, on landing 104 a right turn will give access to the up-traffic lane 110; and, since it is above the store property, lane 110 may be flanked on both sides by parking rectangles. From this point up, the garage of Fig. 6 may be similar to the previously described systems.

If the motorist entering the "A" system had decided to park below street level, he would have chosen traffic lane 112 on ramp 111. In this traffic lane he would have had opportunity to park in rectangles 113 or to gain access to a lower landing immediately below the landing 102. Further subterranean traffic would proceed downward via a ramp directly below the ramp 115, which ramp (below ramp 115) would be single lane and could employ double rows of parking rectangles. Exit traffic from the subterranean lanes would flow up lane 114 on ramp 111 for access to the exit 101, as will be clear.

In the case of "B" system, traffic proceeding upwards on ramp 117 would use a first lane of traffic 118 with parking rectangles 119 on one side thereof. This traffic would have access to the landing 106 and thence upwardly to landing 107 via ramp 120. Ramp 120, accommodating a single lane of traffic, would have twin rows of parking rectangles as shown. Traffic proceeding downwardly from landing 107 would employ ramp 121, which also may have twin rows of parking rectangles and may communicate with the landing 106. Exit flow would then proceed via traffic lane 122 on ramp 117. The traffic lane 122, like the traffic lane 114, would occupy the space which would otherwise be devoted to a row of parked vehicles if the ramp 117 were used for a single lane of traffic. It will be understood that the traffic lane 122 may communicate directly with the exit 102 for the "B" system.

It will be seen that I have described a novel garage arrangement wherein traffic may be accommodated in a continuous flow through a plurality of independent routes. With my arrangement, a maximum of safety is assured for the pedestrian, without sacrifice of freedom in the flow of traffic. Also, without basically modifying the garage structure, and again without impeding the free flow of traffic in any of a plurality of independent traffic systems, commercial use may be made of street front property at the street level or at a plurality of other levels above and below. It will be understood, with particular references to the Fig. 6 arrangement, that stores such as the stores 108—109 may be placed on the other side of the garage, say on the side facing the street into which the traffic from system "A" flows outwardly and that such stores on the "A"-system exit side may be installed and used concurrently with those on the "A"-system entrance side. With such a dual use of stores, it will be understood that ramp 115 and the ramp (not shown) below ramp 115, may be modified to accommodate two lanes of traffic flow in the same manner as ramps 111 and 117 were modified for the Fig. 6 arrangement. With such modifications to ramp 115 and to others above and below as may be necessary, free flow in independent traffic systems may be assured; the only sacrifice entailed is a reduction of the number of parking rectangles for the floors to which the stores extend. Above and below the store levels parking space may be utilized to a maximum, but in any event (for store floors or above store floors) traffic flow for a plurality of independent routing systems may be unimpeded, and safe pedestrian access may be assured.

While I have described my invention in detail for the preferred forms shown, it will be understood that modifications may be made within the scope of the invention as defined in the appended claims.

I claim:

1. In a garage structure, a plurality of substantially horizontal superposed landings at one side of the structure, a second plurality of substantially horizontal superposed landings parallel to and spaced from said first plurality and in substantially the same planes as said first-mentioned plurality of landings, a pair of spaced, parallel, inclined ramps connecting each of said landings at one side of the structure except the uppermost one with a landing of the second-mentioned plurality and in the next higher plane, a pair of spaced, parallel, inclined ramps connecting each of said landings of the second-mentioned plurality except the uppermost one with a landing at said one side of the structure and in the next higher plane, each of said aforementioned pairs of ramps being interfitted with an oppositely inclined pair, whereby each landing, with the exception of the lowermost and uppermost, is provided with a pair of lanes for ascending traffic and a pair of lanes for descending traffic, the adjacent edge portions of certain of the oppositely inclined adjacent ramps being provided with foot-walks, and a horizontally-extending cross-walk joining said foot-walks at a point which is adjacent the intersection thereof.

2. In a garage structure, a plurality of substantially horizontal superposed landings at one side of the structure, a second plurality of substantially horizontal superposed landings at the opposite side of the structure and in substantially the same planes as said first-mentioned plurality of landings, a pair of spaced, parallel, inclined ramps connecting each of said landings at one side of the structure except the uppermost ones with a landing at the opposite side of the structure and in the next higher plane, a pair of spaced, parallel, inclined ramps connecting each of said landings at said opposite side except the uppermost ones with a landing at the opposite side of the structure and in the next higher plane, each of said aforementioned pairs of ramps being interfitted with an oppositely inclined pair, whereby each landing, with the exceptions of the lowermost and uppermost, is provided with a pair of lanes for ascending traffic and a pair of lanes for descending traffic, the adjacent edge portions of certain of the oppositely inclined adjacent ramps being provided with foot-walks, a horizontally extending cross-walk joining said foot-walks at a point which is adjacent the intersection thereof, and a substantially horizontal pedestrian arcade contiguously disposed with respect to at least one of said landings and extending substantially the combined width of all of the ramps which communicate with said landing.

3. In a garage structure, a plurality of substantially horizontal superposed landings at one side of the structure, a second plurality of substan-

tially horizontal superposed landings at the opposite side of the structure and in substantially the same planes as said first-mentioned plurality of landings, a pair of spaced, parallel, inclined ramps connecting each of said landings at one side of the structure except the uppermost ones with a landing at the opposite side of the structure and in the next higher plane, a pair of spaced, parallel, inclined ramps connecting each of said landings at said opposite side except the uppermost ones with a landing at the opposite side of the structure and in the next higher plane, each of said aforementioned pairs of ramps being interfitted with an oppositely inclined pair, whereby each landing, with the exceptions of the lowermost and uppermost, is provided with a pair of lanes for ascending traffic and a pair of lanes for descending traffic, the adjacent edge portions of certain of the oppositely inclined adjacent ramps being provided with foot-walks, a horizontally extending cross-walk joining said foot-walks at a point which is adjacent the intersection thereof, and a pedestrian passage extending vertically with respect to said garage structure and affording communication with said foot-walks and cross-walks.

4. In a garage structure, a plurality of substantially horizontal superposed landings at one side of the structure, a second plurality of substantially horizontal superposed landings at the opposite side of the structure and in substantially the same planes as said first-mentioned plurality of landings, a pair of spaced, parallel, inclined ramps connecting each of said landings at one side of the structure except the uppermost ones with a landing at the opposite side of the structure and in the next higher plane, a pair of spaced, parallel, inclined ramps connecting each of said landings at said opposite side except the uppermost ones with a landing at the opposite side of the structure and in the next higher plane, each of said aforementioned pairs of ramps being interfitted with an oppositely inclined pair, whereby each landing, with the exceptions of the lowermost and uppermost, is provided with a pair of lanes for ascending traffic and a pair of lanes for descending traffic, the adjacent edge portions of certain of the oppositely inclined adjacent ramps being provided with foot-walks, a substantially horizontal pedestrian arcade contiguously disposed with respect to at least one of said landings and extending substantially the combined width of all of the ramps which communicate with said landing, and a pedestrian passage extending vertically with respect to said garage structure and affording communication with said substantially horizontal pedestrian arcade.

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