Dec. 31, 1935. H. L. SMITH, JR 2,026,326

GARAGE CONSTRUCTION

Original Filed Feb. 20, 1932 3 Sheets-Sheet 1

Fig. 1.

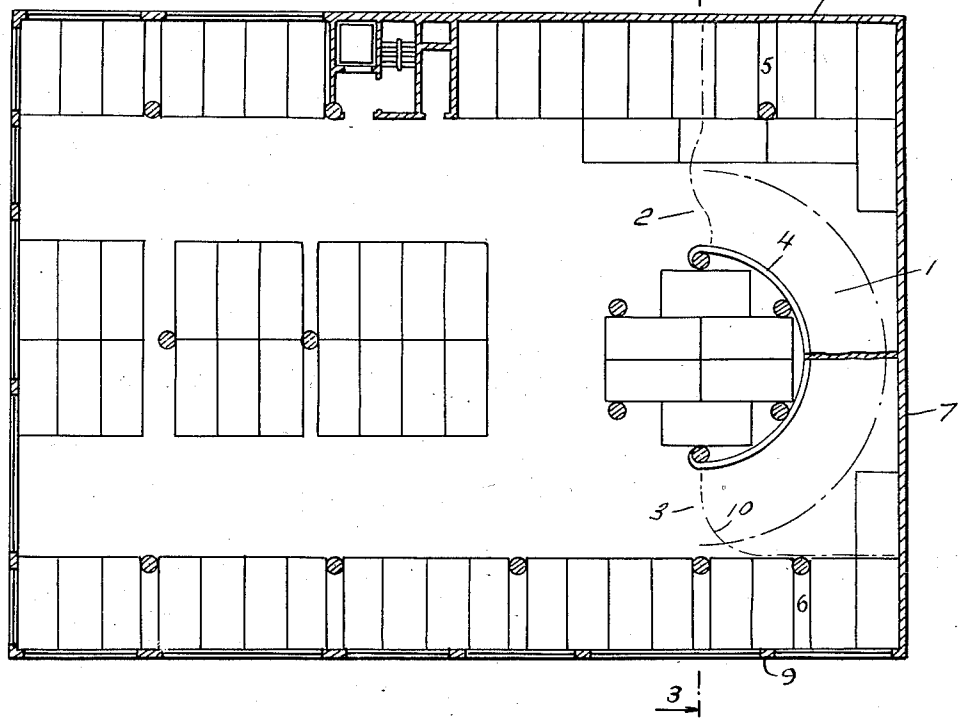


Fig. 7.

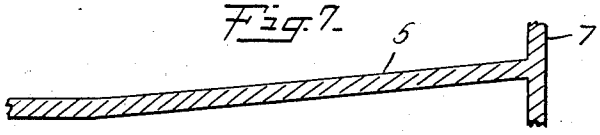


Fig. 8.

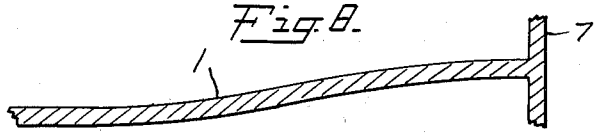


Fig. 9.

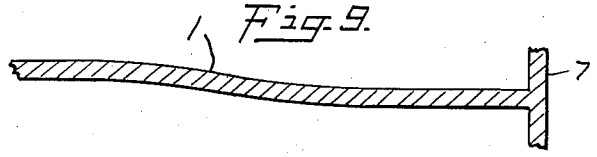
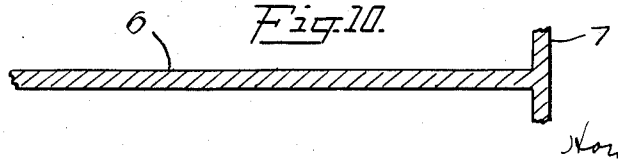


Fig. 10.



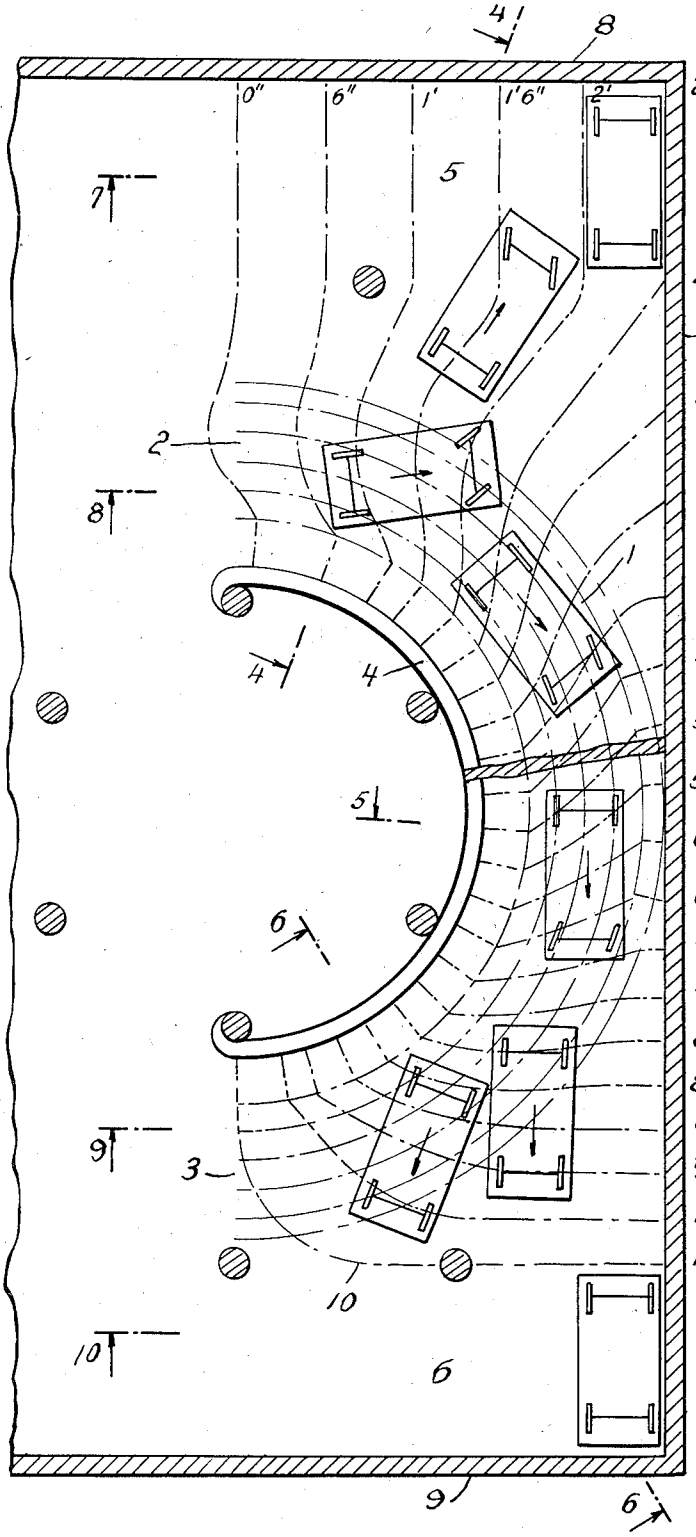
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Fig. 2.



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Original Filed Feb. 20, 1932 3 Sheets-Sheet 3

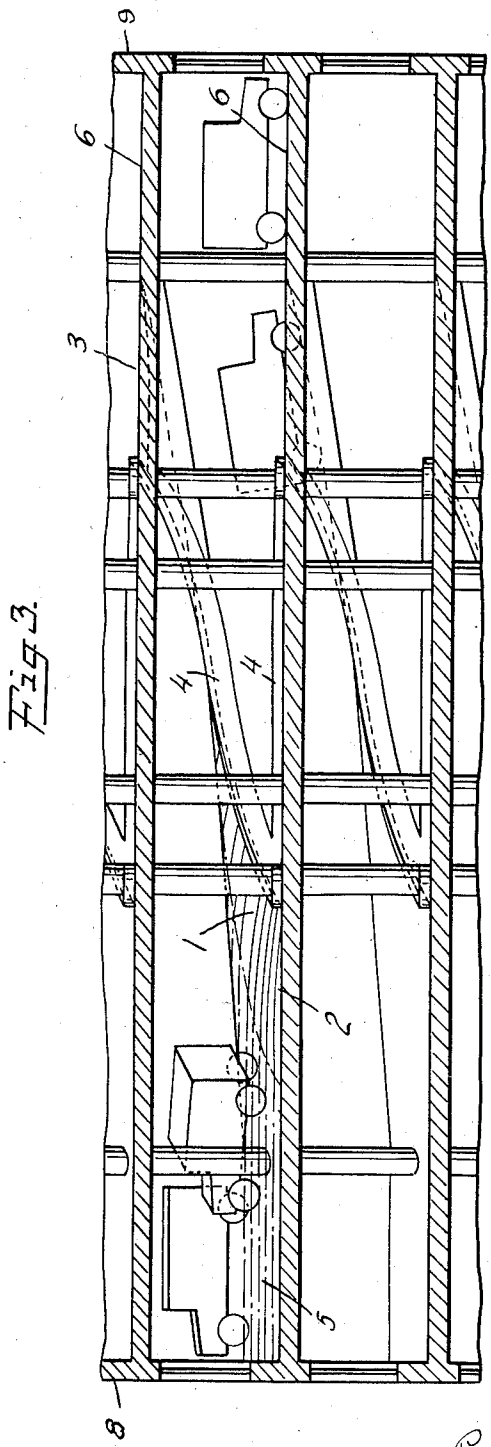


Fig. 3.

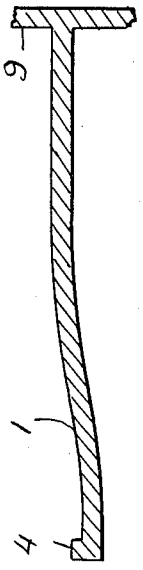


Fig. 5.

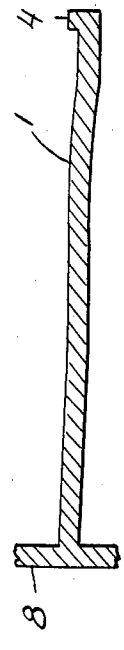


Fig. 4.

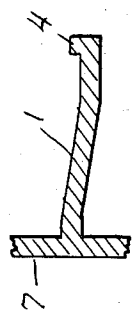


Fig. 5.

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UNITED STATES PATENT OFFICE

2,026,326

GARAGE CONSTRUCTION

Horace L. Smith, Jr., Richmond, Va.

Application February 20, 1932, Serial No. 594,282
Renewed June 4, 1935

6 Claims. (Cl. 20—1.13)

This invention relates to ramp structures for garages and its chief object is to provide a ramp which will afford adequate facilities for the movement of a limited number of cars to and from the various floors of the garage without unduly reducing the rentable area of the floor space.

The ramp is of the semi-spiral type, that is, each driveway between the successive floors consists of an inclined roadway which in its ascent from one floor to the floor above makes a U-turn of substantially 180 degrees. Such a ramp in itself does not occupy much space, but in buildings of moderate size, for example, buildings of 100-foot width, which is the usual dimension of a double city lot, the space on each side of the ramp, while wide enough to permit the storage of cars thereon, cannot be so used because of the difficulty of getting the cars from the garage floors into these restricted spaces.

By the improvement of the present invention this space is made available for car storage by so shaping the ramp and adjacent floor surface as to permit the cars to be driven directly from the ramp onto these outlying floor portions without undue bumping and without straining the frames of the cars, also, of course, without in any way interfering with the free use of the ramp as a passageway from floor to floor.

In the drawings there is illustrated a preferred embodiment of the invention as used in actual practice.

In said drawings:

Fig. 1 is a plan view of a typical floor arrangement of a garage utilizing my improved ramp;

Fig. 2 is an enlarged plan view of the ramp portion of the building shown in Fig. 1 with the contour of the surface of the ramp indicated by contour lines and showing the movement of the cars thereover;

Fig. 3 is a vertical section on line 3—3 of Fig. 1 and extending through three floors of the building;

Figs. 4 to 10, inclusive, are section views through the ramp on the correspondingly numbered lines of Fig. 2.

As shown in Fig. 1, the ramp comprises a semi-circular driveway located at one end of the building and extending from one floor to the other through an arc of approximately 180 degrees. The inclined roadway 1 constituting the ramp connects with the flat portion of the floor of the building at points 2 and 3. In a building of approximately 100-foot width and with the ramp of sufficient radius to be traversed by cars of the usual dimensions, these points of connections with the floors of the building come opposite the aisle spaces so that the rest of the floor area except the portions on each side of the roadway are readily accessible for car storage as will be evident from Fig. 1.

The roadway 1 has a curb 4 around its inner side and as heretofore constructed such roadways were provided with similar curbs around the outer side and the floor spaces beyond this outer curb consisted merely of extensions of the main floor area so that cars to reach these spaces had to be driven therein from the main aisles. This space was therefore unavailable for anything except dead storage. By the arrangement of the present invention this space is made as available for storage as the rest of the floor area thereby increasing the capacity of the garage.

To this end the roadway and the floor space beyond the roadway is shaped as indicated by the contour lines in Fig. 2. That is, the roadway is steeper along the outer edge than at the inner curb of the roadway in the sense that for each degree of turn the surface rises a greater vertical extent. Of course the roadway is not actually steeper at the outer turn in the sense that that term is usually employed because the larger arc of the outer edge of the roadway increases the distance of travel to such an extent that the rise per foot of travel is less than at the inner curb, but the rise per degree of travel is greater. By this arrangement the outer edge of the roadway of the ramp is of such a pitch that it traverses the full distance between the two floors before completing the full 180 degrees of the turn so that the juncture of the inclined portion of the roadway with the flat floor is not confined to the entrance point to the roadway but extends along the contour line 10 in substantially a right angle to the end wall 7 of the building, leaving a space 6 between the roadway and the side wall 9 of the building wide enough for the storage of cars. Hence, cars moving up the ramp as indicated in Fig. 2 can be driven directly off the ramp into the space 6 at the side of the ramp which was heretofore inaccessible except from the main floor.

As will be observed from the contour lines, this increased steepness at the outer edge of the roadway is not uniformly distributed over the length of the ramp but is less at the beginning of the ascent so that at the lower end of the ramp the floor space 5 between the roadway and the wall 8 may have its surface at the same slope as the ramp itself, without making the floor too steep for the cars to be safely parked thereon. This

will be plain from Fig. 2 wherein it will be observed that the contour lines, each of which indicates a vertical rise of six inches, are much closer together at the upper portion of the incline than at the lower portion. In the structure selected for illustration, the total rise from the level floor beyond the roadway to the rear wall of the building is only three feet in a distance of something over thirty feet.

The contour of the driveway permits the cars to be driven to and from the storage spaces at each side of the driveway with a minimum torsional strain on the frames of the cars. The frame of a car is not twisted by the mere elevation of the pair of wheels on one side of the car above the wheels of the other side of the car, or by the elevation of the two front wheels above the two rear wheels. The frame is subjected to torsional strains only when one of the wheels constituting a pair either at the side or at the ends of the car is deflected to a greater extent than the others. Thus, jacking up one wheel of a car subjects the frame to torsional strains while raising the entire front end does not. Otherwise, and more accurately stated, the frame of the car is not subjected to torsional strains so long as the points of contact between its four wheels and the supporting surface can be intersected by the same plane, irrespective of the angle of that plane to the horizontal.

In traversing a driveway of the contour shown in the drawings, the cars move along paths which are either substantially transverse to the incline of the roadway, that is they go either directly up or down the grade, or else travel in paths parallel with the contour lines so that the wheels on one side of the car are both elevated to substantially the same extent above the corresponding wheels on the other side of the car. Hence, the cars may be driven into and out of these restricted storage spaces with no greater difficulty than encountered in driving along the roadway from one floor to the other and with no greater strain on the car.

The improved ramp of this application is of course not restricted in its usefulness to buildings of restricted floor area but is particularly useful in that field because there are other types of ramps, such for example as the double spiral ramp of U. S. Patent No. 1,782,369, dated November 18, 1930, which may be economically employed in large buildings but are not suitable for moderate sized buildings such as the building here selected for illustration. In long buildings and buildings with wings, two or more ramps such as herein disclosed may be used with advantage. It is to be of course understood that the invention is not limited to the specific structure selected for illustration but covers all modifications thereof which fall within the scope of the appended claims.

I claim:

1. In a garage having a plurality of superposed floors, a ramp structure located near one side of the garage comprising an inclined curved roadway of a radius and pitch to be traversed by automobiles of standard dimensions extending in an arc from one floor to the next superposed floor, a portion of the ramp outside of the curved roadway and adjacent the lower floor having a substantially uniplanar parking space sloping upwardly from the floor towards the side of the garage near which the ramp is located, and connected to said curved roadway by a warped surface.

2. In a garage having a plurality of superposed floors, a ramp structure located near one side of the garage comprising an inclined curved roadway of a radius and pitch to be traversed by automobiles of standard dimensions extending in an arc from one floor to the next superposed floor, the vertical rise of the roadway at the outer edge being greater per degree of turn than at the inner edge, the line joining the curved roadway with the floor at the bottom being substantially radial to the curve of the roadway, a portion of the ramp outside of the curved roadway and adjacent the lower floor having a substantially uniplanar parking space sloping upwardly from the floor towards the side of the garage near which the ramp is located, and connected to said curved roadway by a warped surface.

3. In a garage having a plurality of superposed floors, a ramp structure located near one side of the garage comprising an inclined curved roadway of a radius and pitch to be traversed by automobiles of standard dimensions extending in an arc from one floor to the next superposed floor, the vertical rise of the roadway at the outer edge being greater per degree of turn than at the inner edge, with the vertical rise per degree of turn of the outer edge increasing upwardly from the floor at the bottom, the line joining the curved roadway with the floor at the bottom being substantially radial to the curve of the roadway, and the line joining the curved roadway with the floor at the top being substantially tangential to the curve of the roadway, a portion of the ramp outside of the curved roadway and adjacent the lower floor having a substantially uniplanar parking space sloping upwardly from the floor towards the side of the garage near which the ramp is located, and connected to said curved roadway by a warped surface.

4. In a garage having a plurality of superposed floors, a ramp structure located near one side of the garage comprising an inclined curved roadway of a radius and pitch to be traversed by automobiles of standard dimensions extending in an arc from one floor to the next superposed floor, a portion of the ramp outside of the curved roadway and adjacent the superposed floor having a substantially uniplanar space sloping upwardly to said superposed floor, and terminating in a parking space on the superposed floor adjacent the side of the garage near which the ramp is located.

5. In a garage having a plurality of superposed floors, a ramp structure located near one side of the garage comprising an inclined curved roadway of a radius and pitch to be traversed by automobiles of standard dimensions extending in an arc from one floor to the next superposed floor, the vertical rise of the roadway at the outer edge being greater per degree of turn than at the inner edge, with the vertical rise per degree of turn of the outer edge increasing upwardly from the floor at the bottom, the line joining the curved roadway with the floor at the bottom being substantially radial to the curve of the roadway, and the line joining the curved roadway with the floor at the top being substantially tangential to the curve of the roadway, a portion of the ramp outside of the curved roadway and the superposed floor having a substantially uniplanar space sloping upwardly to said superposed floor and terminating in a parking space on the superposed floor adjacent the side of the garage near which the ramp is located.

6. In a garage having a plurality of superposed floors, a ramp structure located near one side of the garage comprising an inclined curved roadway of a radius and pitch to be traversed by automobiles of standard dimensions extending in an arc from one floor to the next superposed floor, a portion of the ramp outside of the curved roadway adjacent the lower floor having a substantially uniplanar parking space sloping upwardly from the floor towards the side of the garage near which the ramp is located, and connected to said curved roadway by a warped surface, a portion of the ramp outside of the curved roadway and adjacent the superposed floor having a substantially uniplanar space sloping upwardly to said superposed floor and terminating in a parking space on the superposed floor adjacent the side of the garage near which the ramp is located.

HORACE L. SMITH, JR.