United States Patent [19]

Klaus

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[54] **GARAGE**

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[21] Appl. No.: **185,824**

Related U.S. Application Data

[63] Continuation of Ser. No. 35,495, May 7, 1970, abandoned, which is a division of Ser. No. 872,431, Oct. 29, 1969, which is a continuation of Ser. No. 611,003, Jan. 23, 1967, abandoned.

[52] **U.S. Cl.** ..... **214/16.1 ED**
[51] **Int. Cl.** **E04h 6/06**
[58] **Field of Search** ..... 214/16.1 R, 16.1 ED

[56] **References Cited**

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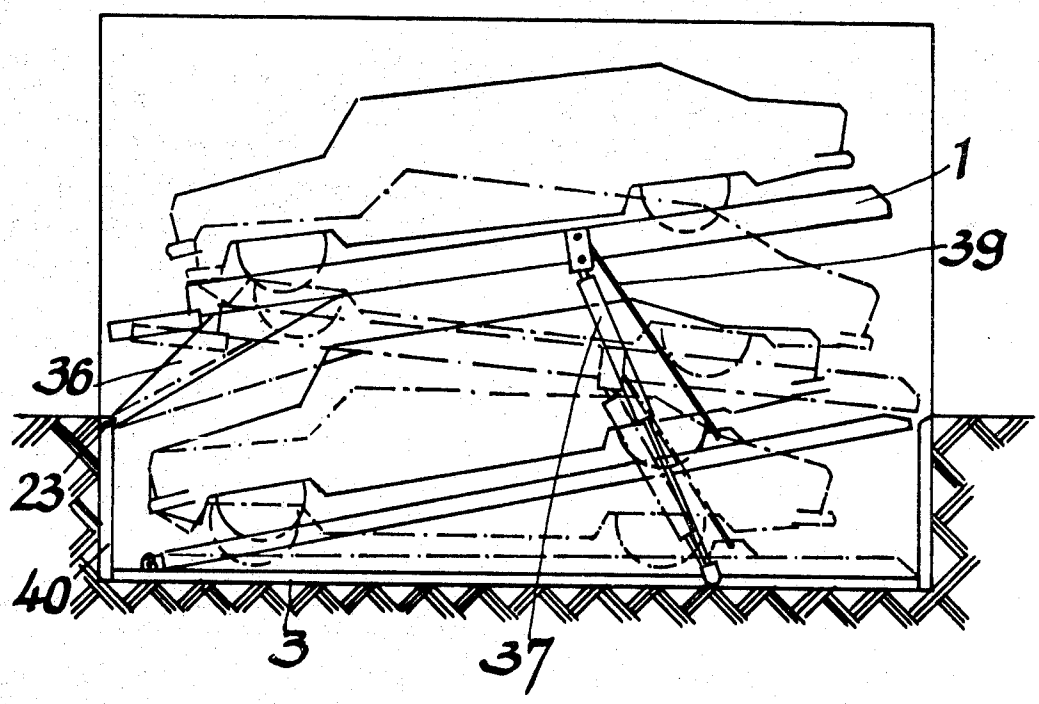
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[57] **ABSTRACT**

A garage including two mobile platforms for motor vehicles arranged one above the other, the lower platform being rotatable about an axis located at the end remote from the entrance to the garage, and the upper platform being connected with the lower platform in such a manner that either platform can be selectively placed adjacent the entrance.

2 Claims, 8 Drawing Figures



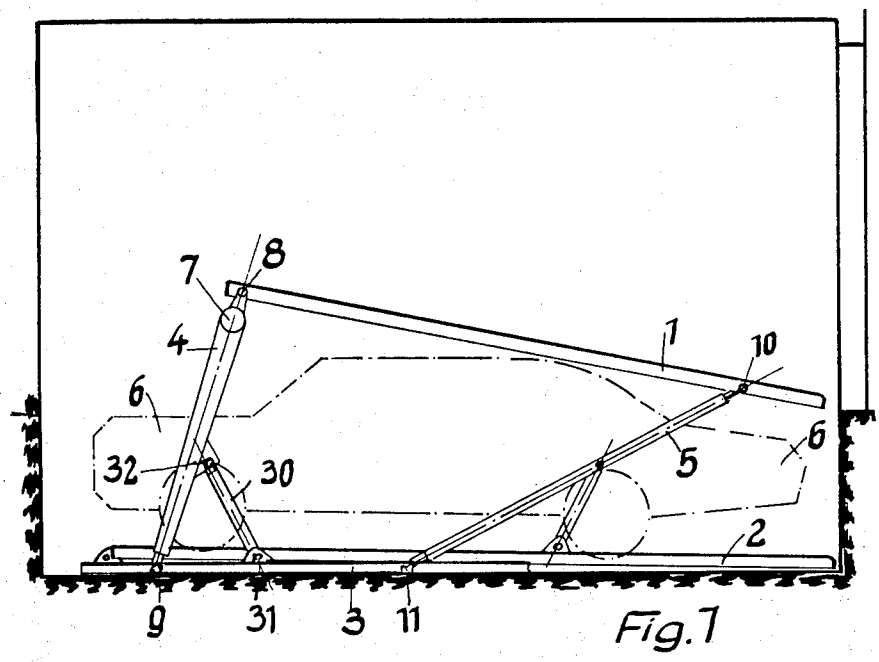
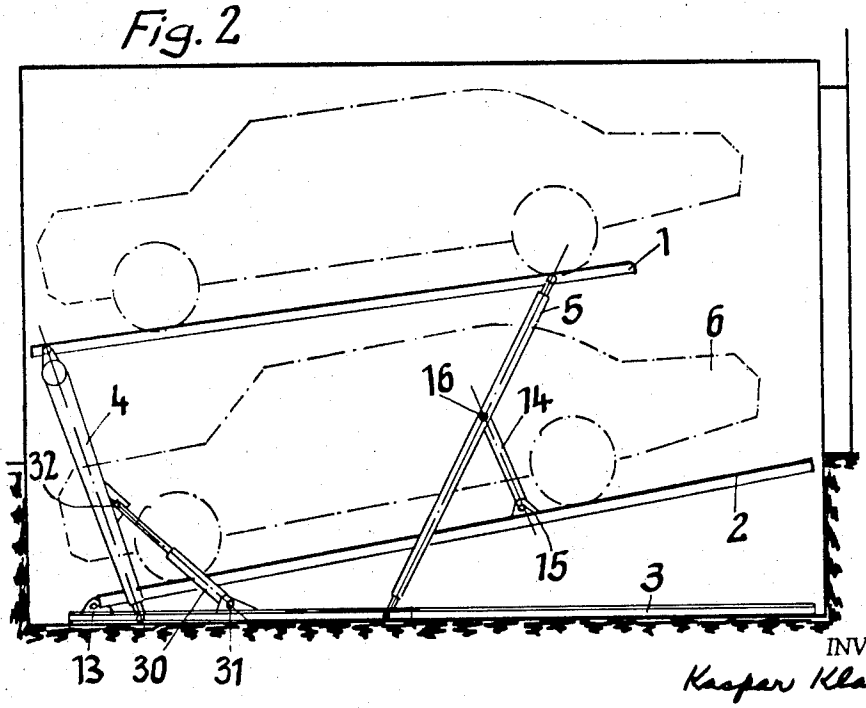


Fig. 1

Fig. 2



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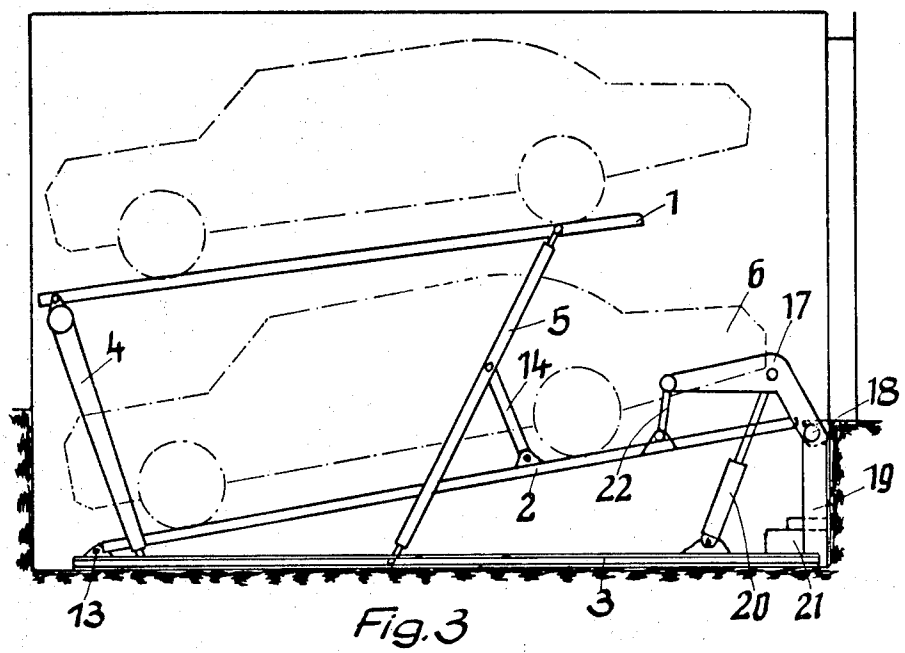
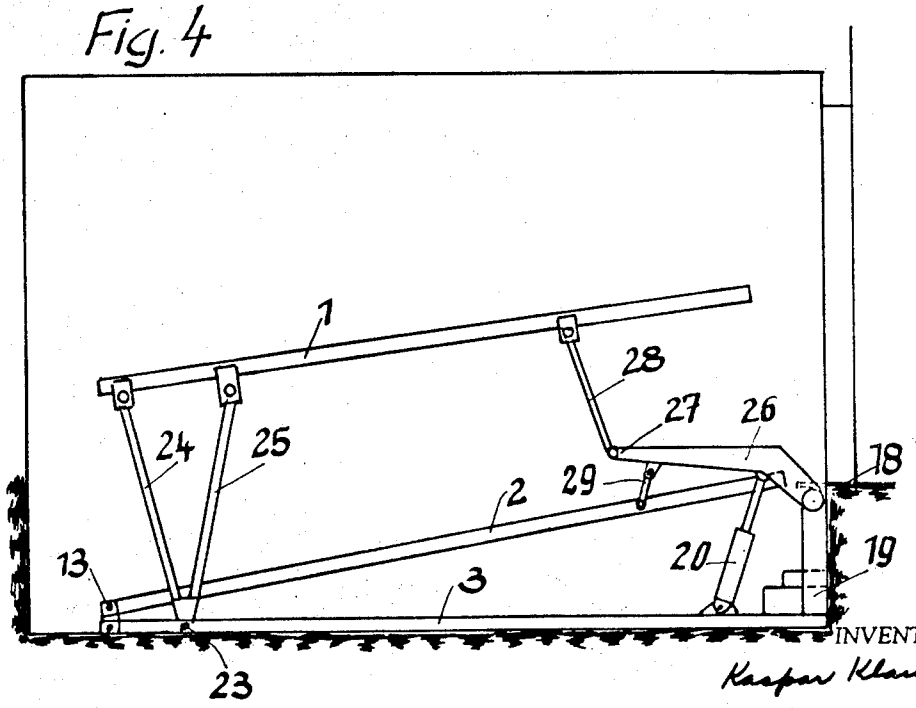


Fig. 3

Fig. 4



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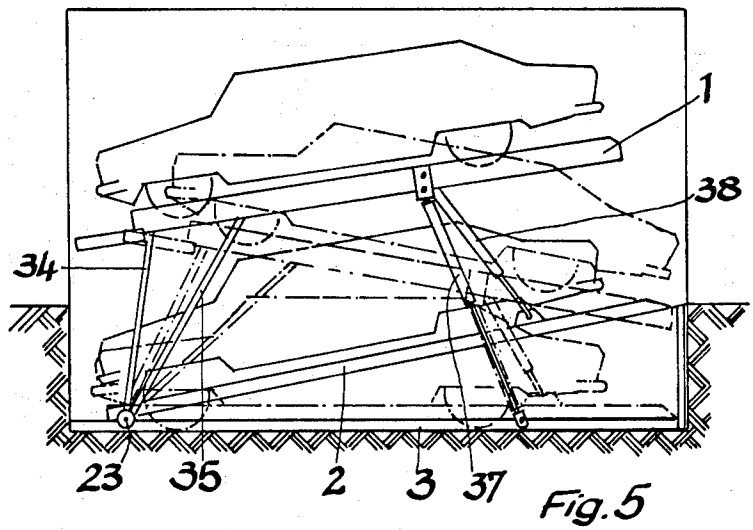
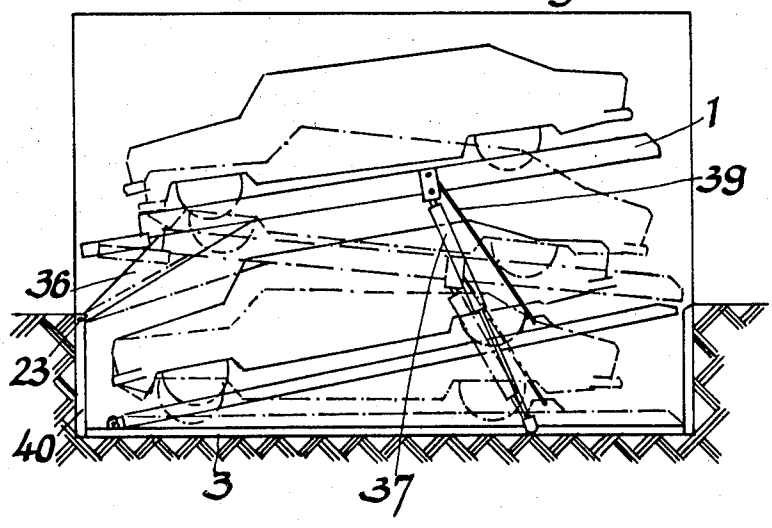


Fig. 5

Fig. 6



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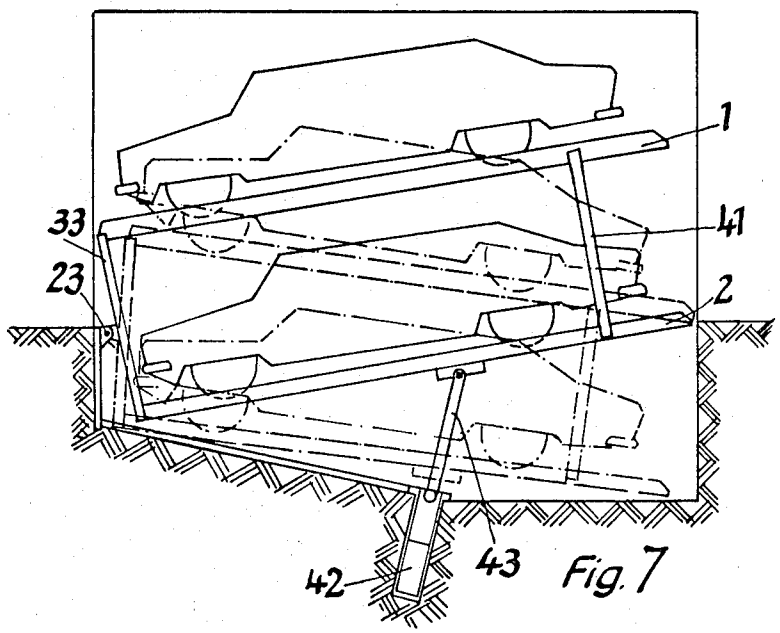
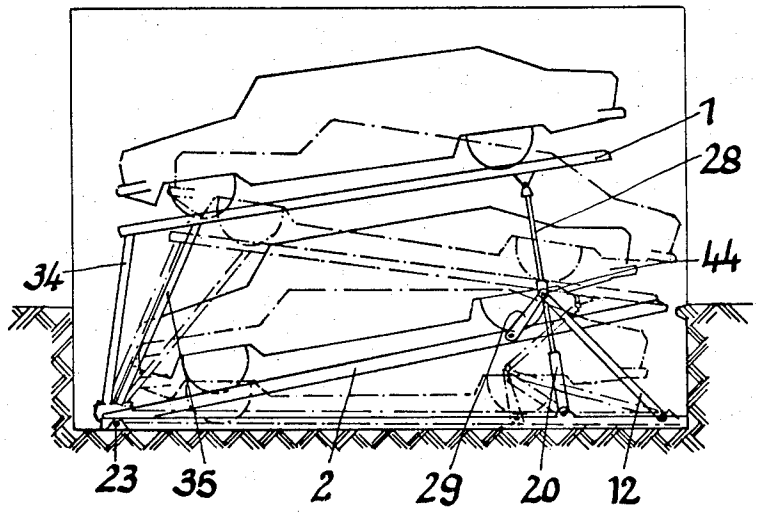


Fig. 7

Fig. 8



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GARAGE

This application is a continuation of application Ser. No. 35,495 filed May 7, 1970, now abandoned, which is a divisional of application Ser. No. 872,431, filed Oct. 29, 1969, which is a streamlined continuation of Ser. No. 611,003, filed Jan. 23, 1967, now abandoned.

The present invention relates to a garage with two mobile platforms for motor vehicles arranged above each other.

It is the purpose of the invention to provide a garage of the above-mentioned type which makes it possible to park two vehicles above each other. In this garage the upper and the lower platform shall be accessible at any time by simple transposition of the platforms. An essential object of the invention is to make the arrangement in such a manner that the horizontal space requirements of the garage are the same, or only slightly more, than the space required for parking a single vehicle. A further object of the invention is to keep the height dimensions of the garage as small as possible. In spite of this, the space available in the individual parking places shall be sufficient to park motor vehicles of practically any type on either of the two platforms.

Finally it is the object of the invention to carry out the mean for moving the platform as simply as possible in order to keep the manufacturing expenses as low as possible and to guarantee a safe and reliable operation.

The present invention proposes first of all a garage which is characterized by the fact that the lower platform is pivotable around an articulation at its end remote from the entrance to the garage. The entrance is at a level approximately the height of the type of vehicle to be garaged above the lower platform when this platform is horizontal. The upper platform is coupled to the lower one and during the lifting movement thereof there is also an approximately arcuate movement directed away from the entrance.

In the garage according to the invention the lower platform is thus essentially only lifted with its end adjacent the entry if this platform is to be made accessible, or lowered if the upper platform is to be used. The upper platform carries out, as compared to the lower platform, a more or less wide shifting movement. The accessibility of the lower platform is improved thereby, the necessary inclinations of the platforms are diminished and the complete space requirement of the double garage is reduced.

The invention is hereafter explained on the basis of some preferred embodiments.

FIG. 1 and FIG. 2 show two operating positions of a garage according to the invention;

FIG. 3 shows a modified embodiment, and

FIGS. 4 to 8 show further variations of the invention.

In the embodiment according to FIGS. 1 and 2, the upper platform is designated with the reference number 1 and the lower platform with 2. Both platforms are carried by the base frame 3. For the upper platform 1 the rods 4 and 5 are provided in pairs outside of the space receiving the vehicle 6 on the lower platform 2. The front rods 4 may be connected by a bracing tube 7 running parallel to the articulation points 8, 9, 10 and 11 of the rods 4 and 5. Throughout this description the words "articulation" and "articulated" preferably mean "pivot" and "pivoted." This bracing rod is provided in order to increase the stability of the complete arrangement.

For the drive of the articulated square formed by a part of the base frame 3, the rods 4 and 5 and the upper platform 1, a cylinder-piston combination 30 is provided, which is articulated at the articulation point 31 on the base frame 3 and the articulation point 32 of the rods 4. According to the admission of pressure medium to the cylinder piston group 30, the upper platform 1 can be shifted from the position shown in FIG. 1 in that according to FIG. 2 and vice-versa.

The lower platform 2 is articulated at 13 on the base frame 3 and connected by means of the connecting link 14 between the articulation points 15 and 16 with the rod 5. The lower platform is thus moved simultaneously with the upper platform 1 but the path of movement of the lower platform 2 is different from the path of movement of the upper platform 1.

In the representation according to FIG. 1 the garage is in the drive-in position for the upper platform 1. In the representation according to FIG. 2 the lower platform 2 can be used or the lower vehicle 6 can leave the garage.

The embodiment according to FIG. 3 is different from that according to FIGS. 1 and 2 by the arrangement of the drive device.

The pivot arm 17 is carried rotatably at 18 and is supported e.g., by means of the element 19 on the base frame 3. The pivot arm is arranged laterally of the lower platform 2 and preferably one pivot arm 17 is provided on each side of the platform 2. Between the base frame 3 and the pivot arm 17, the cylinder-piston combination 20 is arranged, into which pressure medium can be admitted by the driving arrangement 21, consisting of motor and pumps. The driving arrangement 21 is situated in the central plane of the garage. In order to exclude a collision of the lower platform 2 with the driving arrangement 21 in the lowered position of the lower platform 2, this lower platform 2 has a recess or is subdivided in two driving tracks respectively.

The pivot arm 17 acts through the intermediate rod 22 on the lower platform 2 and the drive of the upper platform 1 takes place by means of the rods 14 and 5.

In the embodiment according to FIG. 4 the upper platform 1 with the rigid double stays 24 and 25 is rotatable around the articulation 23 on the base frame 3. The lower platform 2 moves around the articulation 13 at the front end. The tilting arm 26 which is carried and driven in the same manner as the pivot arm 17 in the embodiment according to FIG. 3, is connected on its free extremity 27 with a rod 28 engaging the upper platform 1 and driving it. The rod 29 represents the connection between the tilting arm 26 and the lower platform 2.

In the representations of FIGS. 5 to 8 the lowered positions are shown in dot-and-dash lines along with the lifted positions of the two platforms.

In the embodiment according to FIG. 5, this upper platform 1 is supported similar to the embodiment according to FIG. 4 on the base frame 3 by means of pivot 23 and supports 34 and 35 rigidly connected with the upper platform. The lower platform 2 is connected with the upper platform 1 by means of a tension member 38 while the lifting device 37 which may be similarly shaped to the cylinder and piston combination 20 and 30, engages on the upper platform 1. By the tension member 38 it is possible for lower platform 2 to remain in its lowermost position during part of the lowering

movement of the upper platform 1. The tension member 38 which has a telescope-type configuration is pushed together until the extremity at the side of the entrance of the upper platform 1 is in its drive-in position. Thereby sufficient space is left for the vehicle on the lower platform.

Instead of the tension member 38, a rope, a chain, or the like may be used. This is shown in FIG. 6. FIG. 6 is different, furthermore, from the embodiments described above by the fact that the upper platform 1 is supported by means of a supporting member 36 on the articulation 23 which is provided above the base frame and connects it with the latter by means of the support 40, otherwise supporting member 36 is the same as supports 34 and 35 of FIG. 5.

In the embodiment according to FIG. 7, the two platforms are connected with each other by rigid support 33 and 41 to form a rigid structure. This structure is moved by a cylinder-piston combination 42 and 43, sunk in the floor of the garage and fastened on the lower surface of the lower platform 2.

The embodiment according to FIG. 8 is finally characterized by the rigid supports 34 and 35 which cause similar to the embodiment according to FIG. 5 a supporting of the upper platform 1 in the common articulation 23 for both platforms. For the movement of the platform a pivot arm 12 is provided, at the free extremity of which the cylinder-piston combination 20 is fastened. The connection articulation of the cylinder-piston combination 20 and of the pivot arm 12 is designated as 44 and serves simultaneously as a fastening point for the intermediate rods 28 and 29. The rod 28 connects the cylinder-piston combination 20 with the upper platform 1, while the rod 29 represents the connection with the lower platform 2.

Although the invention has been described and illustrated in detail, it is understood that this does not delimit the invention. The spirit and scope of this invention is limited only by the language of the appended claims.

I claim:

1. A garage for parking motor vehicles in a minimum amount of space, said garage comprising an entrance; a cavity below the level of said entrance capable of containing at least one motor vehicle; a base frame positioned at the bottom of said cavity; support means at the end of said cavity opposite said entrance; two motor vehicle storage platforms in stacked relationship; pivot means on said support means at a height approximately equal to the entrance level; connecting means joining the upper platform with the lower platform, at least one of said connecting means being rigidly attached to the upper platform and pivotably connected to said support means by said pivot means; and lifting means to lift and lower the upper and lower platforms so as to selectively position either platform adjacent said entrance to receive and exit motor vehicles, and wherein said one connecting means is rigidly connected to the portion of the upper platform opposite from said entrance; said lower platform is pivotably connected at the end thereof opposite from said entrance to said base frame; said lifting means is connected to the portion of the upper platform towards said entrance and said connecting means includes tension means connected between the upper and lower platforms towards said entrance so that when said lifting means is actuated, both platforms pivot about their respective pivot points.

2. A garage for parking motor vehicles in a minimum amount of space, said garage comprising an entrance; a cavity below the level of said entrance capable of containing at least one motor vehicle; a base frame positioned at the bottom of said cavity; support means at the end of said cavity opposite said entrance; two motor vehicle storage platforms in stacked relationship; pivot means on said support means at a height approximately equal to the entrance level; connecting means joining the upper platform with the lower platform, at least one of said connecting means being rigidly attached to the upper platform and pivotably connected to said support means by said pivot means; and lifting means to lift and lower the upper and lower platforms so as to selectively position either platform adjacent said entrance to receive and exit motor vehicles, and wherein said one connecting means is at least one rigid member rigidly attached to the ends of each of the upper and lower platforms opposite said entrance and said rigid member is pivotably connected to said pivot means at a point intermediate its attachment to the upper and lower platforms; said connecting means including at least one further rigid member rigidly attached to the portions of each of the upper and lower platforms adjacent said entrance; and said lifting means is attached to the lower platform so that when it is actuated, both the upper and lower platforms pivot about said pivot means.

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