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H. HORNBOSTEL ET AL

STORAGE BUILDING

Filed June 13, 1925

Fig. 1.

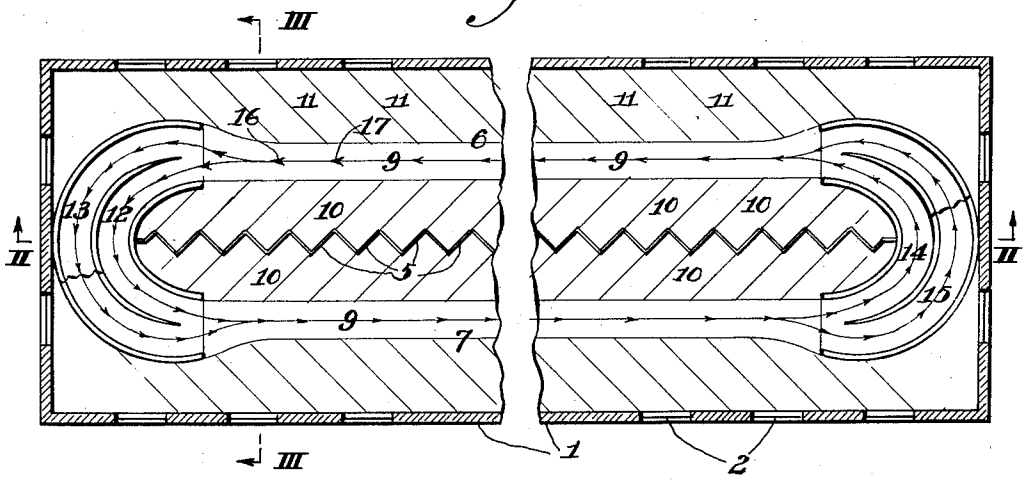


Fig. 2.

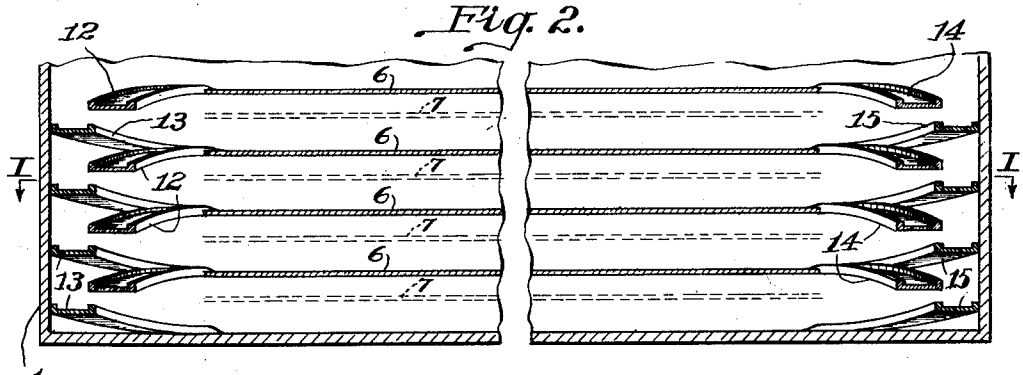


Fig. 3.

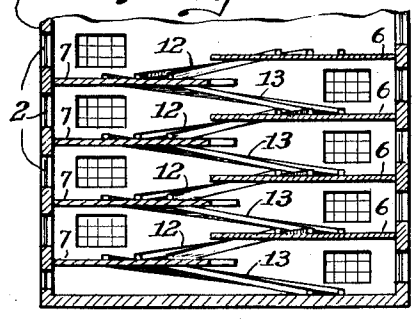
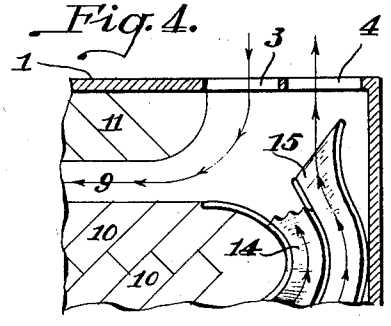


Fig. 4.



WITNESSES

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STORAGE BUILDING.

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This invention relates to the structure of storage buildings, and particularly to buildings applicable for storing motor vehicles, and, specifically, to that type of such buildings in which groups of relatively staggered floors are connected by ramps.

The object of the invention is to provide a building of the character described which will provide for the storage of a maximum number of motor vehicles within the cubical space of the building, and which is so constructed that any number of vehicles may simultaneously travel to and from their storage spaces on any of the several floors, in ascending and descending streams moving in the same direction, so that there can be no interference between ascending and descending vehicles, and this notwithstanding that ascending and descending streams of vehicles may move simultaneously over the same floor spaces or driveways. A further object is to provide a building of this character in which the storage floors can be indefinitely multiplied vertically, either upwardly or downwardly, from the street level.

In the accompanying drawings Fig. 1 is a horizontal sectional view of the preferred arrangement of building embodying our invention, on the line I—I, Fig. 2; Fig. 2 is a vertical longitudinal section on the line II—II, Fig. 1; Fig. 3 is a vertical transverse section, on the line III—III, Fig. 1; and Fig. 4 is a horizontal section of a portion of a floor showing the entrance and exit for the vehicles.

1 indicates the outer walls of the storage space, which may be either the external walls of a building, or walls inside of a larger building. When they are external walls, they are provided with window openings 2, and at the street level are provided with an entrance opening 3, and an exit opening 4, which entrance and exit openings may be either at one corner of the building, as shown in Fig. 4, or anywhere along the side of the building.

The space within the walls 1 is divided vertically midway of its width, such as along the line 5, Fig. 1. There are two series of floors,—the series 6 on one side of the dividing plane 5 being spaced equal distances one from the other and from the ground or bottom floor; while the series 7 on the opposite side of the dividing plane 5, lie in planes between the planes of the floors 6, the lowermost floor 7 lying in a plane between the bottom or ground floor and the lowermost floor 6. The floors 7, however, are not exactly midway between the floors 6, being spaced a less distance from the next adjacent higher floor 6 than from the next adjacent lower floor 6, for a purpose hereinafter described.

Substantially midway along each floor is a driveway 9, thus providing parking spaces for cars on both sides of this driveway, viz, spaces for cars 10 between the driveways and the central dividing plane, and spaces for other cars 11 between the driveways and the side walls of the building. These driveways, with the ramps next described form a continuous circulation path extending entirely around the central longitudinal portion of the building; in other words, entirely around the centrally parked cars 10.

At each end of the building are a pair of concentric curved ramps connecting each one of the floors of either series 6 or 7 with the next higher and the next lower floor of the other series. For instance, from the driveway 9 at the upper portion of Fig. 1, which, say, represents one of the floors 6, a ramp 12 leads downwardly to the next adjacent lower floor 7 while another ramp 13 leads upwardly to the next adjacent higher floor 7; whereas at the opposite end of the building a ramp 14 leads from floor 7 upwardly to the next adjacent higher floor 6, while ramp 15 leads downwardly to the next adjacent lower floor 6.

With this arrangement, whether incoming or outgoing, all the vehicles travel in the same direction. Suppose for instance two vehicles are moving along on the driveway 9 on floor 6 in the direction of the arrows 16 and 17 shown on Fig. 1, and that one of these cars is going down and the other is going up. The car going down will take the ramp 12 on the left hand end, continue on the driveway 9 on the next lower floor 7, on the lower half of said figure, take the ramp 15 on the right hand end down to the next lower floor 6, and will so continue to circulate until it reaches the desired floor level; whereas the car which is going up will take the ramp 13 on the left hand end and ascend to the driveway 9 on the next higher floor 7, and then take the ramp 14 at the right hand end and thus climb to the next higher floor 6, and so on. Consequent-

ly no matter how many vehicles are entering or leaving, some going to higher levels and some to lower levels, there can be no interference because all vehicles travel in the same direction, so while at times up-going and down-going vehicles are on the same driveway on a given floor, there nevertheless can be no interference or crossing of paths because said vehicles merely follow one after the other and each takes its appropriate ramp as it approaches the end of the floor.

Also at the entrance and exit of the building there can be no interference because, as shown in Fig. 4, the entering cars keep to the right, while the cars coming out, by also keeping to the right pass out through the exit without interfering with the incoming cars.

The building described can be of any size, depending on the ground space available or other conditions. The two longitudinal driveways with pairs of connecting ramps at their ends can be located in any part of the floor area, the balance of the floor area being available as storage spaces. The two rams at each end are preferably curved and concentric. Consequently with the same grade or pitch the outer one will climb to a greater height than the inner one. It is for this reason that the floors of the series 7 are not exactly midway between the floors of the series 6, each being closer to the floor 6 immediately above the same than to the floor 6 immediately below the same. It will be noted that the outside ramp is the upgoing ramp at one end and the downgoing ramp on the other end of the building. Consequently the pitches or grades of all ramps can be the same. It is of course not absolutely necessary to have exactly the same grades for the two ramps of each pair, but this is preferable and is possible by merely spacing the floors of the two series such distances apart that with equal inclinations of the inner and outer ramps the outer ramp will climb a distance equal to the larger floor spacing and the inner ramp will climb a distance equal to the smaller floor spacing. Having the ramps curved and concentric has the advantage that a car can enter a ramp in a substantially straight line and thus dispense with the necessity of space on the floor in which to swing the car into the ramp, as is required when the ramps are straight. Hence the driveways on the floors can be limited in width to that of a single car, and, further, can be located a minimum distance from the central plane of the building. In fact this distance can be less than the length of a car, the necessary space being secured by placing the cars diagonally as shown and allowing their front ends to project underneath the opposite next higher floor. As a result the over-all width of the building can be reduced to a minimum, or otherwise stated, the maximum storage or parking space is secured for any given dimension of building.

The plan described enables the building to be constructed of any height; that is to say, there can be any number of floors arranged one above the other, without in any way increasing the difficulty of getting cars in and out at the same time. These several floors can all be arranged above the street level, or some can be arranged above the street level and some below the street level, or all of them can be below the street level. It makes absolutely no difference in what direction, up or down, the building is extended.

We claim:

1. A multiple-story storage building for vehicles provided with a plurality of concentric interrupted spiral ways in spaced apart relation and relatively long intermediate levels connecting said ways to constitute run-ways for a single line of traffic between the cooperating terminals of said spiral ways, the run-ways connecting the opposite terminals of said spiral ways being in staggered relation, and having a zig-zag partition wall extending longitudinally of said building.

2. A multiple-story storage building for vehicles provided with a plurality of concentric interrupted spiral ways in spaced apart relation, and run-ways common to both terminals of said spiral ways provided intermediate the cooperating terminals of said spiral ways, said run-ways being relatively staggered and adapted to accommodate a single line of vehicle traffic operating in one direction between the cooperating terminals of said spiral ways, and having a zig-zag partition wall extending longitudinally of said building.

3. A building structure comprising outer walls, a series of superposed floors overlying the area within said walls on one side of a longitudinal vertical plane, a second series of superposed floors lying in planes intermediate the planes of the first series of floors and overlying the area on the opposite side of said longitudinal vertical plane, a vertical series of similar pairs of ramps at each end of the enclosed area, one ramp of each pair connecting a floor of one series with the next higher floor of the other series and the other ramp of said pair connecting the said floor of the first series with the next lower floor of the other series, the said floors at the longitudinal vertical dividing plane having edges of zig-zag formation.

4. A building structure comprising outer walls, a series of superposed floors overlying the area within said walls on one side of a longitudinal vertical plane, a second series of superposed floors lying in planes intermediate the planes of the first series of floors and overlying the enclosed area on the oppo-

site side of said longitudinal vertical plane, a vertical series of similar pairs of concentric curved ramps at each end of the building, one ramp of each pair connecting the floor of one series with the next higher floor of the other series, and the other ramp of said pair connecting the said floor of the first series with the next lower floor of the other series, the said ramps at the one end of the building extending forwardly in the opposite direction from the ramps at the other end of the building, the said floors at the longitudinal vertical dividing plane having edges of zig-zag formation.

In testimony whereof, we hereunto sign our names.

HENRY HORNBOSTEL.
WILLIAM J. STRASSBURGER.