Sept. 11, 1928. 1,683,937

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METHOD AND CONSTRUCTION FOR STORING MOTOR VEHICLES

Filed March 18, 1927 2 Sheets-Sheet 1

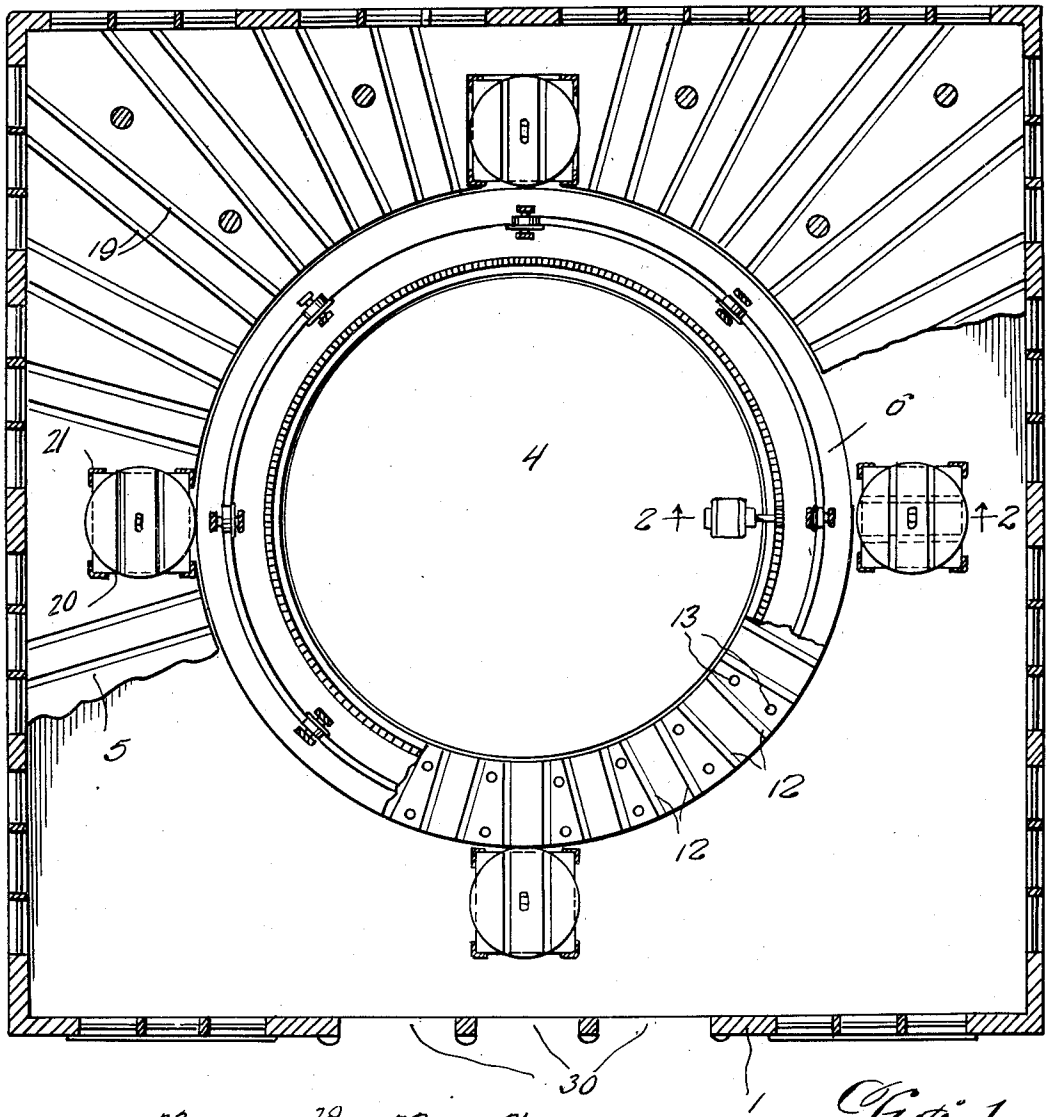


Fig. 1.

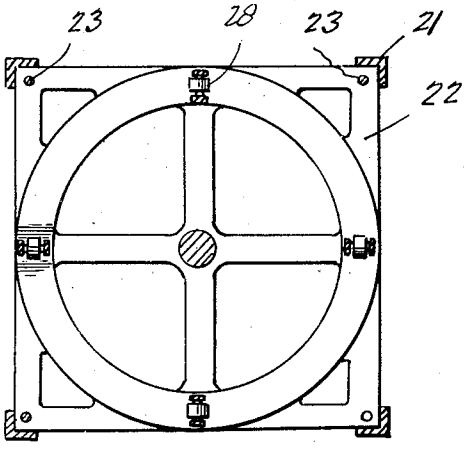


Fig. 3.

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Fig. 2.

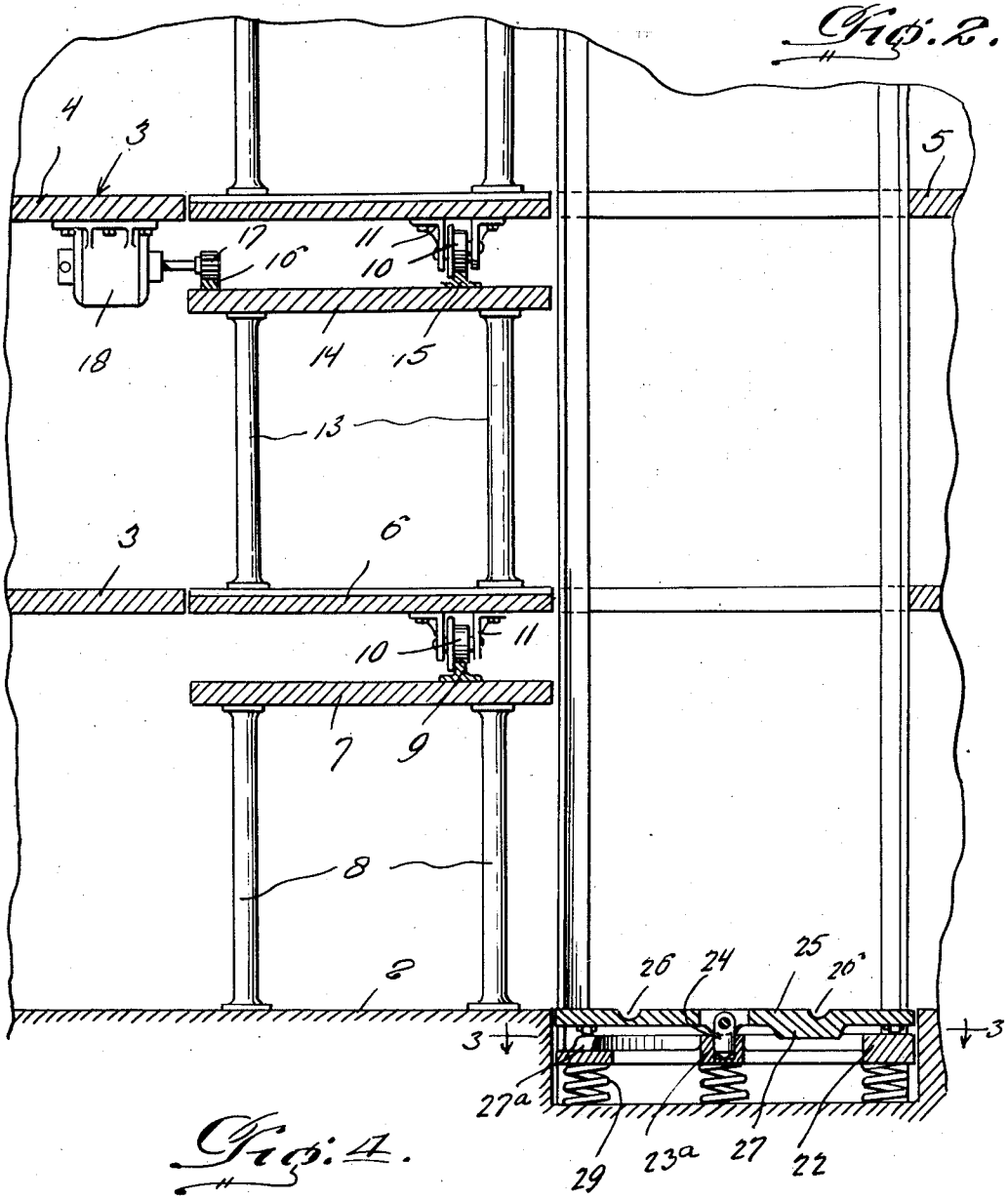
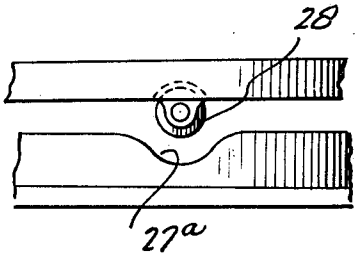


Fig. 4.



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METHOD AND CONSTRUCTION FOR STORING MOTOR VEHICLES.

Application filed March 18, 1927. Serial No. 176,306.

This invention relates to a system and a construction for the storage of motor vehicles particularly adapted for use in large cities in order that the floor space in a building of predetermined size may be used in a building to quickly and conveniently store a maximum number of vehicles on each floor in a short space of time, and to deliver such vehicles readily from any point in the building on short notice.

An object of the invention resides in providing a system of storing motor vehicles in which a system of pockets are arranged throughout a plurality of floors or decks of a building structure, one above the other, having an annular passageway communicating with the entrance of the pockets on each deck with suitable elevators for carrying vehicles from the bottom of the building, to the annular passageways in each of said decks so that they may be conveniently conveyed in such passageways to successively fill the pockets in a predetermined manner, in which every vehicle will be accessible for independent delivery to a point of entrance of the building.

A further object of the invention resides in providing a building construction having a plurality of floors or decks, each divided to provide a series of adjacent and radially arranged pockets, with respect to an annular movable storage section on each floor or deck, adapted to convey vehicles to each stationary pocket on the floor from suitable elevators communicating at one or more points with each of the annular movable sections of each floor, in order to permit of ready access being obtained to any vehicle so that it may independently be stored in any predetermined pocket, and removed therefrom through the same elevator and entrance, in a short space of time.

The invention further includes the special features of construction of the several parts by which the annular passageway can be used for the most part as a storage space as well as for conveying motor vehicles from the pockets on the floor of the building communicating therewith, to a suitable elevator which includes a suitable means adapted for rotating the vehicles on the elevator, to retain them thereon in one position, and which is operable to allow the vehicle to gravitate off of the elevator in another position, in order that the vehicles may be quickly and expeditiously handled in a short space of time for storing and delivery from any storing space to the entrance of the building.

The invention comprehends the numerous other objects residing in the specific details of construction and arrangement of the parts, for carrying out the invention, all of which are more particularly pointed out in the following description in detail, and the claims directed to the preferred system and construction for the building, it being understood, however, that various changes in the size, shape and arrangement of the parts and the specific system may be made without departing from the spirit and scope of the invention as herein set forth.

In the drawings forming part of this application:—

Figure 1 is a horizontal sectional view thru a building constructed in accordance with the invention, showing a part of the structure of one of the upper floors in which the vehicles are stored and portions of which are broken away to show the details of construction for operating the annular movable storage and conveying member, as well as showing the construction of the main floor, in which the management, and operation for the building is handled.

Fig. 2 is a vertical sectional view through the portion of the building taken approximately on the line 2—2 of Fig. 1.

Fig. 3 is a horizontal sectional view taken on the line 3—3 of Fig. 2, showing particularly, the details of construction of the elevator for the building.

Fig. 4 is a detail view showing a portion of one edge of the elevator illustrating the construction of the support and movable vehicle carrying platform which is constructed to permit the tilting of the platform in discharging the vehicle from the elevator.

1 indicates the outer wall structure of the building which has a ground floor 2 and a plurality of upper floors 3. Each of the upper floors or decks of the building are formed to provide a central circular floor portion 4 and an outer floor portion 5 having the inner edge terminating in spaced concentric relation with respect to the central portions 4. Between the periphery of the central portion 4 of each floor and the inner annular edge of the outer portion 5 there is mounted a ring-shaped movable floor section 6.

A ring-shaped track supporting member 7 is mounted in spaced relation above the bottom floor 2 on suitable supporting pillars or

posts 8, and support the annular track section 9 on which rides the supporting rollers 10, rotatably mounted in the brackets 11, carried by the movable floor section 6 of the first floor above, for rotatably supporting said floor section 6 in the horizontal plane of the sections 4 and 5 of the second floor.

The movable floor section 6 is provided with a plurality of adjacent pairs of track grooves 12 spaced apart a distance equal to the tread spacing of the wheels of a motor vehicle, so that a plurality of vehicles may be mounted and supported in these grooves 12 in adjacent relation for storage on the movable floor section, or for conveyance from one position in the building to another.

Between each pair of track grooves 12 are mounted posts 13 which support the ring sections 14 which with the floor section 6 forms what is hereafter termed as a movable or rotatable storage and conveyor member. This structure is duplicated each floor, above the first floor of the building, and the ring section 14 of the conveyor member on one floor, carries the track section 15 on which run the rollers 10 carried by the floor sections 6 of the floor next above, so that each of the combined conveyor and storage members is supported one above the other, and upon each other in superimposed relation for independent relative rotative movement.

The ring member 14 for each of these members carries at its inner edge portion, an annular rack member 16, with which meshes the pinion 17 of the drive motor 18. The drive motor 18 is mounted on the central section 4 of each floor and on the under side thereof for driving the storage and conveyor member for the floor below, as clearly illustrated in Fig. 2.

The outer portions 5 of each floor beginning with the second floor and progressing upwardly, are formed with pairs of track grooves 19 in radial relation to the conveyor members which are each adapted to receive the wheels of motor vehicles to be stored in this portion of the building, which are moved onto the floor portions 5 from the rotatable conveyor members of the floor for storage purposes.

The central portion 4 of each floor is also used for storage purposes, and may or may not be provided with groove tracks for receiving motor vehicles stored thereon from the rotatable conveyor member of the particular floor.

At a plurality of points, which is shown in Fig. 1, each of the floor sections 5 adjacent to the conveyor members are formed with vertically aligned openings 20 in the corner portions of which extend the vertical guides 21, and provide an elevator well at each quarter section of the building. The guide rails 21 slidably receive the elevator carriage frame 22 which has suitable elevating cables 23 secured in the corner portions thereof, so that the frame may be raised to any desired position of the guides throughout the height of the building by any suitable elevating mechanism now used and well known in the art.

The central portion of this frame 22 is formed with a bearing 23^a for the stud 24 having the upper end pivotally mounted in the rotatable platform 25. This platform is provided with track grooves 26 to receive the wheels of motor vehicles, and is counterbalanced at 27 so as to normally retain the platform in a horizontal position.

The carriage 22 has the rim portion thereof formed with a depression 27^a at the side positioned adjacent to the center of the building and in radial alinement therewith. The lower face of the platform 25 carries at the periphery thereof, suitable supporting and guide rollers 28 sliding on the rim portion of the frame 22, so that when one of these rollers is positioned over the depression formed in the rim of the carriage 22, the platform may be tilted on the two rollers having the axis at right angles thereto.

This construction is made so that when the trackways 26 of the platform 25 are in radially alined position with the trackways 12 in any one of the rotatable conveyor members, the weight of a motor vehicle may be used for tilting the platform so that the inclination will cause the vehicle to gravitate from the elevator onto the conveyor rings.

In this way, by suitable control means, motor vehicles may be elevated to any floor, and the platform 25 rotated to bring the forward and heavier end of the vehicle to position so that it will be adjacent to the conveyor ring with the roller 28 positioned over the depression 27, as a result of which, the platform will tilt and the vehicle will gravitate from the elevator onto the adjacent conveyor member. This permits of the vehicle's entering the elevator from any one of three positions, while they are always elevated in a position in which the axis of the vehicle, or the length of the vehicle is positioned in a plane parallel with the walls of the building during the elevation, and when it is desired to discharge the same from the elevator, it is turned so that it will be in a position in radial alinement with the trackways of the conveyor members.

Suitable cushioning springs 29 are positioned at the bottom of each elevator shaft in the usual manner to cushion the motion of the elevator carriage at the bottom of the shaft.

The lower floor of one side of the building, which will be the front, is formed preferably with three entrance openings, as indicated at 30 for vehicles to be stored in the central one of which will lead directly into the elevator at the front of the building and in alined relation with the openings.

The openings at the opposite sides of the

center will permit of vehicles entering the building for passing to the other three elevators shown, so that a plurality of vehicles can be handled in storage and delivery simultaneously and expeditiously with the use of this construction.

The entire first floor of the building will be open and no vehicles will be stored therein, as it will be used for making minor repairs, oiling, and washing of the vehicles, when owners thereof desire this service, or other minor services and adjustments which may be necessary and can be made during the period of time that the vehicle is left stored.

The keeping of the first floor free and open, also permits of the ready shifting of the vehicles, from one elevator to another to be stored on the floors above and in maneuvering the same to enter or leave the entrance openings 30.

In using a building construction of this character, for the storage of motor vehicles, it will be understood that vehicles enter as above described through the opening 30. The operators of the building, will then receive the vehicle for storage from the owner desiring such service, providing proper checking and identification means, so that it may be delivered upon presentation of such identification and payment for the storage.

The operators of this garage or storage building will then take charge of the vehicle and place it on any one of the elevators, in a position, so that its length will be at right angles to the track grooves in the conveyors on the several floors or as indicated in full lines at the left hand side of Fig. 1, whereupon the vehicle is elevated on the floor on which it is desired to store the same.

The platform 25 of the elevator, is then rotated to bring the track grooves 26 in alinement with one pair of grooves 12 in the storage and conveyor member when the desired floor is obtained, so that the front end of the vehicle extends inwardly. As soon as the forward end reaches this inward position, the roller 28 of the platform will register with the groove 27 in the frame which will permit the vehicle to gravitate on the storage and conveyor member for the particular floor.

At this point, the elevator may then be lowered to the ground floor for the next vehicle, while the rotatable storage and conveyor member may be rotated to bring the grooves carrying vehicle in alinement with some of the grooves 19 of the floor portion 5, or any part of the central section 4 of the floor, and the vehicle moves from the conveyor member onto a desired portion of the floor for storage.

It may also be left on the conveyor member for storage, as all of the grooves thereon may be used for storage purposes except one or two, which will permit the shifting of the storage and conveyor member for receiving any vehicle on the floor which it may be desired to store or remove from any storage space to any elevator.

It will be seen that this elevating and storage operation may be carried out with this construction and in accordance with this system, of handling the vehicles independently of one another, so that any vehicle in any storage pocket in the entire building may be obtained on short notice and readily conveyed in a convenient manner to one of the elevators, and delivered onto the first floor. In this way, a vehicle may be stored or it may be delivered from its stored position in any position in the building, in the space of about four minutes' time from the time it is delivered or called for. This construction therefore permits of the construction of a storage building for vehicles employing this system of construction and operation, in which a large number of vehicles may be stored so that there will be no unused space or waste of space and that will still provide for the immediate access to any one vehicle in the building.

It is furthermore to be clearly understood, that with the operation of the system and construction of this kind, a large number of vehicles can be handled with a minimum number of employees thereby reducing considerably the operating expense of a storage warehouse.

Having thus described my invention, what I claim as new is:—

1. In a vehicle handling and storing structure, in combination, a building including a floor having a rigid central section of disk-like configuration, a rigid marginal section surrounding and disposed in a plane with said central section, said marginal section being spaced from the central section to provide an annular opening between the edges of said sections, said marginal section being provided with individual pairs of radial grooves forming vehicle runways, said runways being circumferentially spaced apart, a turn table mounted for rotation in said annular opening and disposed in a plane with said rigid floor sections and provided with circumferential grooves for reception of the vehicle wheels, an elevator including a travelling frame provided with an annular track having a depression formed therein, and a rotatably mounted platform disposed above said track and having rollers on its bottom movable on the track and receivable in said depression, said platform being provided in its top with grooves adapted to aline with the grooves in said turn table, said depression being placed so that the grooves on the platform can be alined with those on the turn table.

2. In a vehicle handling and storing structure, in combination, a building having a floor for storage purposes including an an-

nular turn table, said turn table having circumferentially spaced radial grooves for reception of the vehicle wheels, an elevator including a traveling frame provided with an annular track and a rotatably mounted platform disposed above said track and provided on its bottom with rollers movable on the track and provided in its top with grooves, said track having a depression formed therein for receiving one of said rollers, whereby a predetermined set of grooves in the turn table, may be alined with the depression, and whereby the platform may be rotated to permit a certain one of the rollers to fall into said depression, at which time the grooves in the platform, will be alined with the grooves in the turn table.

In testimony whereof I affix my signature.

EDWIN H. WHITE.