

Aug. 2, 1966

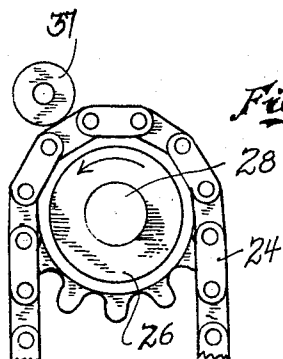
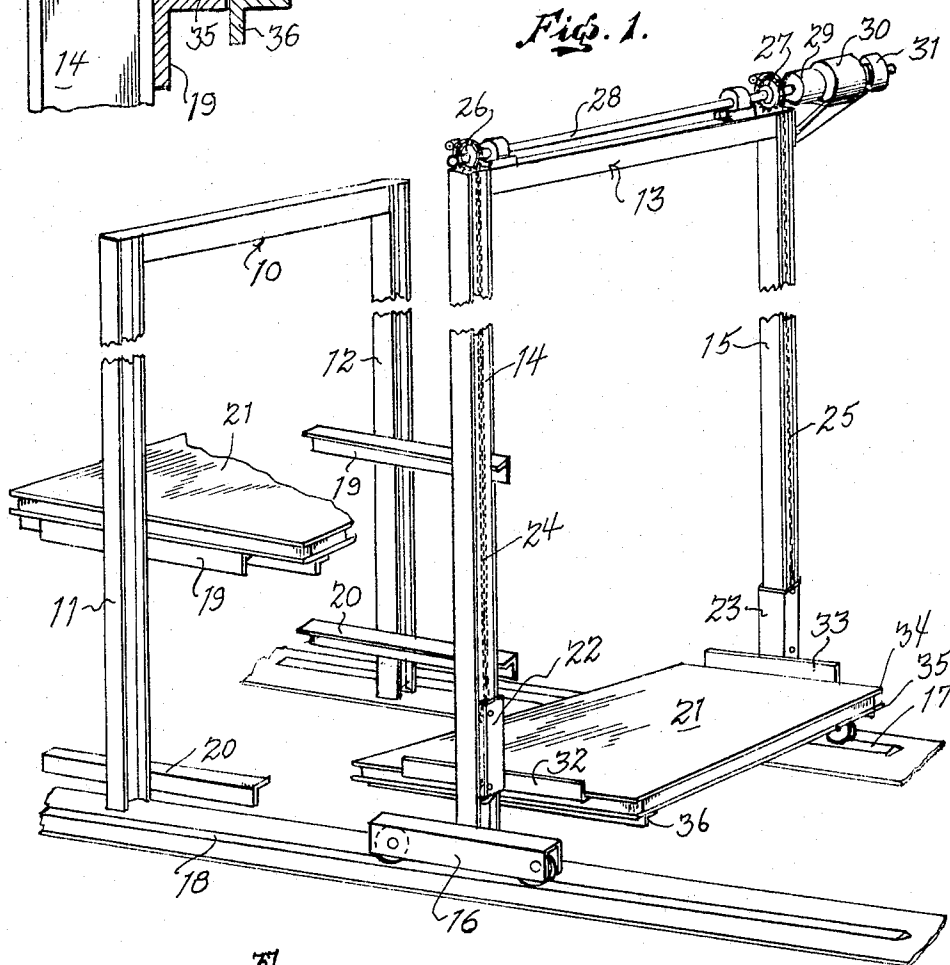
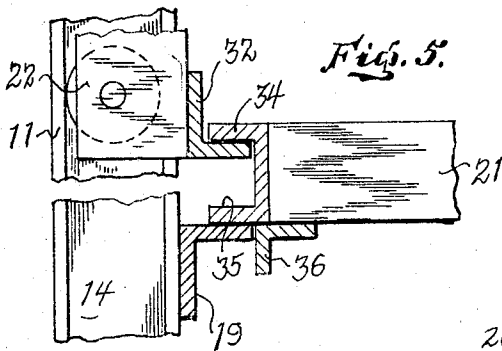
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3,263,831

PALLETIZED STORAGE DEVICE

Filed Oct 19, 1964

2 Sheets-Sheet 1



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2 Sheets-Sheet 2

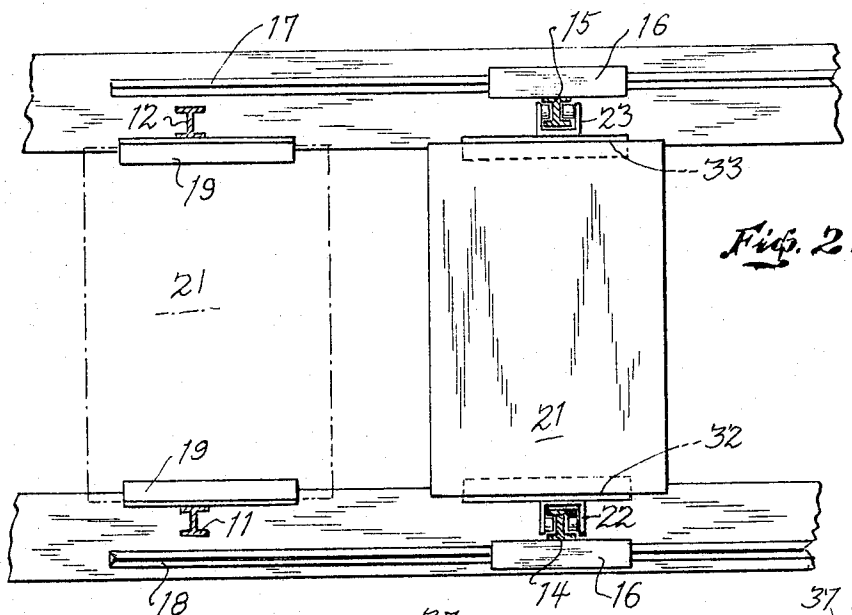


Fig. 2.

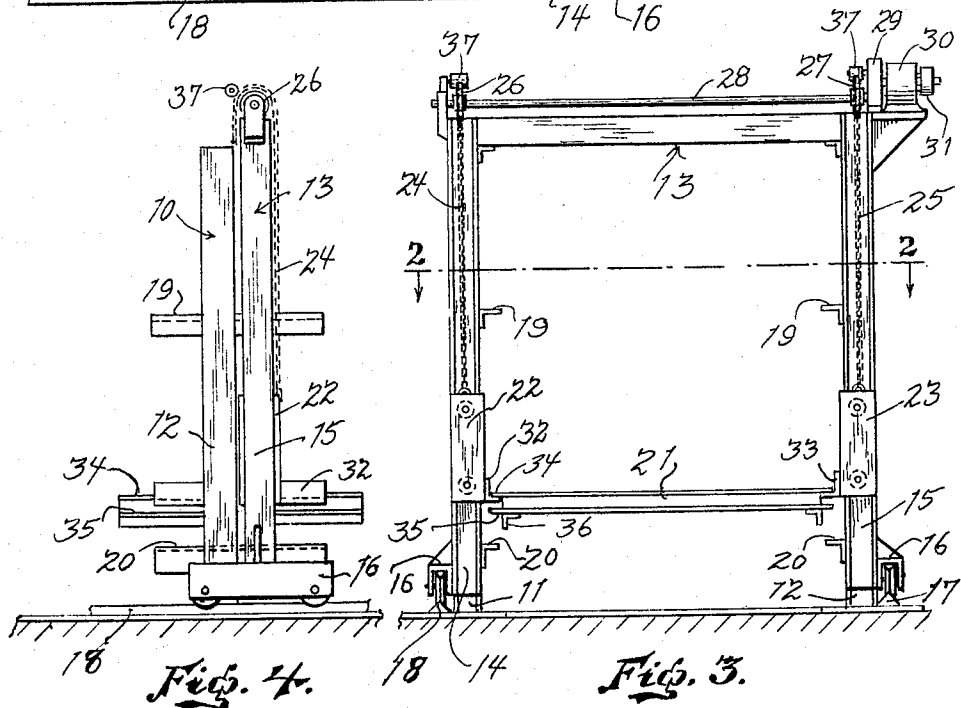


Fig. 4.

Fig. 3.

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PALLETIZED STORAGE DEVICE

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4 Claims. (Cl. 214—16.1)

My present invention relates to an improved storage facility and more particularly to a mechanical article handling and storing device for increasing the storage capacity of an area where property values space and other considerations make conventional enclosed storage structures impractical.

The main object of my invention is to provide a device by which a plurality of automobiles and/or units of palletized merchandise may be parked or stored in an effective, economical and practical manner.

A further object of the invention is to provide an article storing device employing a number of pallets or platforms upon which the articles are placed having a movable pickup gantry means by which the loaded pallets are placed in tiered relationship upon a stationary supporting structure.

Another object of the invention is to provide a new and novel device having a stationary supporting structure with oppositely disposed pallet engaging brackets and a cooperating movable gantry unit having pallet engaging means adapted and arranged to pick up automobile carrying pallets and/or palletized merchandise at ground level and transfer the pallets at various elevations to the oppositely disposed brackets of the stationary supporting structure for storage in a tiered arrangement.

Other objects and advantages will be in part evident to those skilled in the art and in part pointed out hereinafter in connection with the accompanying drawing, wherein there is shown by way of illustration and not of limitation a preferred embodiment of the invention.

In the drawing wherein like numerals refer to like parts throughout the several views:

FIGURE 1 is a fragmentary perspective showing of the essential elements and arrangement contemplated by my invention,

FIGURE 2 is a plan view of the arrangement taken in a plane along section line 2—2 of FIGURE 3,

FIGURE 3 is an end elevation of the device as shown in FIGURE 1,

FIGURE 4 is a side view showing the two major elements of my device in a nested position for the transfer of the pallets from one to the other of said major elements,

FIGURE 5 is a fragmentary sectional view showing details of construction, and

FIGURE 6 is a fragmentary view showing a further detail of construction.

For a detailed description of the invention reference is made to the accompanying drawings wherein the numeral 10 designates a stanchion like structure consisting of two spaced vertically extending columns 11 and 12 and the numeral 13 designates generally a gantry like structure having two vertically extending columns 14 and 15. The columns 14 and 15 of the gantry like structure 13 are carried by trucks or trolleys 16 that move along two spaced trackway forming rails 17 and 18 which extend along the outside of the columns 11 and 12 of the stanchion structure 10. The stanchion structure 10 may be of any desired height and is primarily intended to provide a support for the storage of palletized articles and/or automobiles in a tier at various levels.

In FIGURE 1 of the drawing the columns 11 and 12 of the stanchion structure are shown broken away and as each having only two oppositely disposed shelf forming brackets 19 and 20 upon which a pallet 21 is adapted to rest when positioned thereupon. In this showing the

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gantry structure 13 is shown as having oppositely disposed vertically movable carriages 22 and 23 which are suspended for vertical movement along the columns 14 and 15 by sprocket chains 24 and 25 which pass respectively over sprockets 26 and 27 that are carried by a shaft 28 that is driven through a reduction gear 29 by an electric motor 30. Associated with the motor 30 there is a dynamic brake 31 for preventing rotation of the shaft 28 when the controlled circuit of motor 30 is open. An important feature of the invention, as shown in FIGURE 2 of the drawing, resides in the fact that the carriages 22 and 23 operated by the sprocket chains 24 and 25 carry platen engaging brackets 32 and 33 and the shelf forming brackets carried by the columns 11 and 12 of the stanchion structure 10 are located so as to substantially overlap each other when the gantry structure 13 is moved into close proximity to the stanchion structure 10. This insures that the pallets will be evenly balanced upon the gantry structure 13 when in transit and when finally positioned upon the shelf forming brackets of the stanchion structure 10. This feature is clearly illustrated in the drawings where in FIGURE 2, the pallet engaging brackets 32 and 33 carried by the carriages 22 and 23 of the gantry structure 13 are shown as offset to the left of the columns 14 and 15, whereas the shelf forming brackets 19 carried by the columns 11 and 12 are offset to the right. As result when the gantry structure 13 is moved into close proximity with the stanchion structure 11, as shown in FIGURE 4, these pallet supporting members will come substantially into register with each other.

As is more clearly shown in FIGURE 5 of the drawings the pallet 21 has two outwardly extending flanges or upper and lower support engaging lips 34 and 35 at each end thereof. The upper lip 34 as here shown is adapted and arranged to be engaged by the platen engaging brackets 32 and 33 of the gantry structure 13 and the lower flange 35 is adapted and arranged to engage with the shelf forming brackets 19 carried by the stanchion structure 10. To insure freedom of relative movement between the platen engaging bracket 32 of the gantry 13 and the ends of the pallet 21 when the parts are in the position shown the pallet 21 is also provided with a depending flange 36 that will serve to center the pallet 21 between the columns 11 and 12 of the stanchion structure 10.

As indicated in FIGURES 1 and 3 of the drawings the vertically movable carriages 22 and 23 carried by the sprocket chains 24 and 25 will move downwardly when the motor 30 is operated in one direction and move upwardly when the rotation of the motor 30 is reversed. Since the sprocket chains 24 and 25 pass freely over the sprockets 26 and 27 with their other ends hanging freely at the far side of the sprockets 26 and 27 I have provided a retaining means in the form of rollers 37 that operate in conjunction with the sprockets 26 and 27 to retain the chains 24 and 25 in full traction engagement with their respective sprockets. In this arrangement the chains 24 and 25 need only be of a length sufficient to encompass the desired vertical movement or lift of the pallets 21. When the pallet 21 has been raised to a level corresponding to any pair of the pallet supporting brackets 19 of the stanchion structure 10 the gantry 13 will be moved to the left as viewed in FIGURE 1 to thus place the pallet 21 carried thereby upon pallet supporting brackets 19 of the stanchion structure. Following this by a slight lowering of the carriages 22 and 23 to a point where the support of the pallet 21 will be transferred to the pallet supporting brackets 19 the gantry structure 13 can then be moved to the right and free of the pallet 21 for a subsequent operation which will permit the lifting and positioning of an additional pallet 21 upon pallet sup-

porting brackets 19 at a different level upon the stanchion structure 10.

While I have, for the sake of clearness and in order to disclose the invention so that the same can be readily understood, described and illustrated a specific device and arrangement, I desire to have it understood that this invention is not limited to the specific means disclosed, but may be embodied in other ways that will suggest themselves to persons skilled in the art. It is believed that this invention is new and all such changes as come within the scope of the appended claims are to be considered as part of this invention.

Having thus described my invention, what I claim and desire to secure by Letters Patent is:

1. In a storage device of the character and for the purpose described, the combination of a pair of railway defining rails, a stanchion structure straddling said railway having vertically extending columns located inwardly with respect to the rails of said trackway, a plurality of vertically spaced horizontally extending shelf forming brackets carried by each of said columns engageable by a pallet extending horizontally therebetween, a gantry structure having trucks mounted upon the rails of said trackway, a vertical carriage supporting column carried by each of said trucks in line with the columns of said stanchion structure, vertically movable carriage mounted upon each of said latter columns having platen engaging brackets, a horizontally extending shaft extending laterally above the columns of said gantry structure having a shaft with two sprockets located one above each of said columns, a motive power means for rotating said shaft in a forward and reverse direction, chains connected at one end to each of the vertically movable carriages upon the gantry structure and hanging free at the other side of said sprockets, and a plurality of article supporting pallets having means at their ends engageable by the brackets carried by said vertically movable carriages and other means engageable with the shelf forming brackets of said stanchion structure, characterized by the fact that the shelf forming brackets of said stanchion structure and the pallet engaging means of said gantry structure are adapted and arranged to move into overlapping relationship when the columns of said

stanchion structure and the columns of said gantry structure are brought into contact with each other by movement of said gantry structure along said trackway, whereby pallets engaged by the pallet engaging brackets of the vertically movable carriages of said gantry structure may be individually transported to and from the shelf forming brackets of said stanchion structure.

2. The invention as set forth in claim 1, characterized by the fact that the means at the ends of said plurality of article supporting pallets for engagement with the vertically movable brackets carried by said vertically movable carriages with the shelf forming brackets of said stanchion structure consists of two vertically spaced horizontally extending flanges at the ends of the pallets, the upper one of which is adapted and arranged to be engaged by the brackets of said vertically movable carriages and the lower one of which is adapted and arranged to engage with the shelf forming brackets of said stanchion structure.

3. The invention as set forth in claim 2, characterized by the fact that in addition to the upper and lower flanges carried by said article supporting pallets as engageable with the brackets carried by said vertically movable carriages and with the shelf forming brackets of said stanchion structure said pallets have a third depending flange inwardly from the ends thereof for holding the pallets against lateral displacement when placed upon the shelf forming brackets of said stanchion structure.

4. The invention as set forth in claim 1, characterized by the fact that the chains connected at one end to each of the vertically movable carriages of said gantry structure are maintained into traction producing engagement with sprockets at their free ends by a retaining means under which the chain passes in its travel over said sprockets.

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