

Nov. 4, 1969

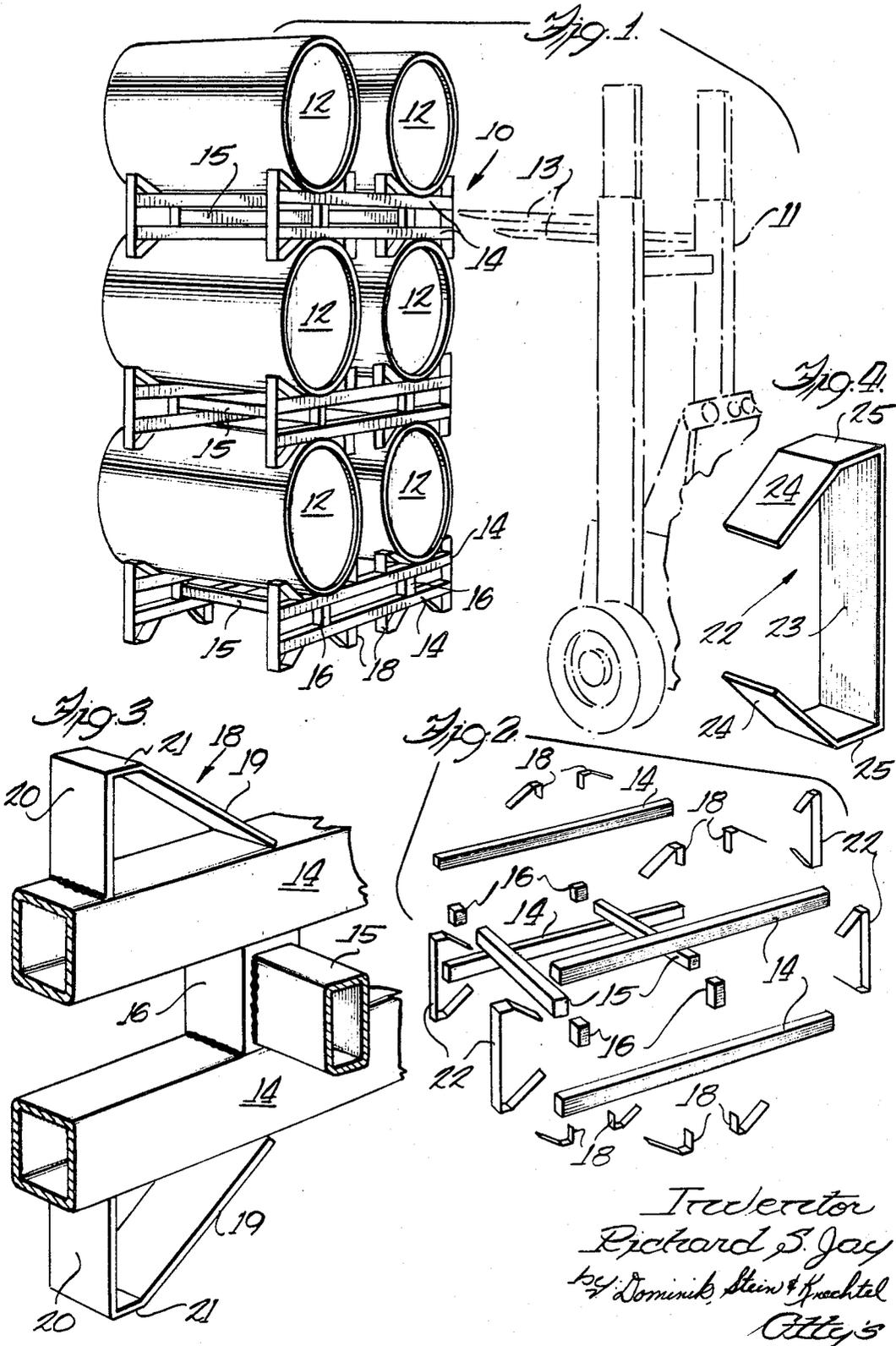
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3,476,260

STORAGE RACK FOR CYLINDRICAL CONTAINERS

Filed Dec. 5, 1967

3 Sheets-Sheet 1



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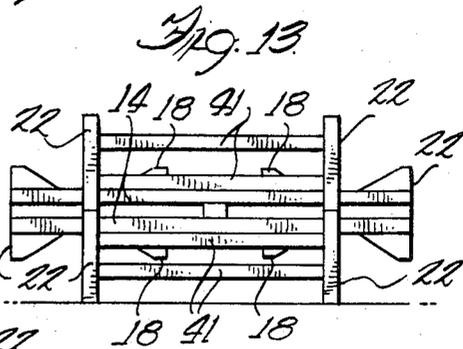
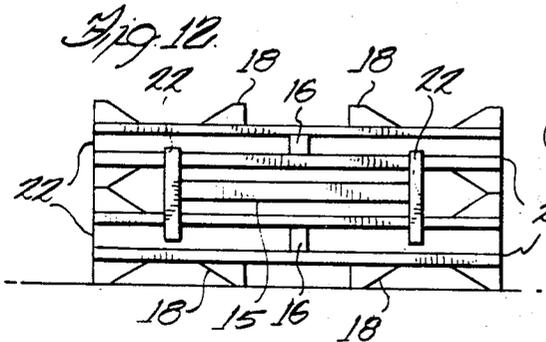
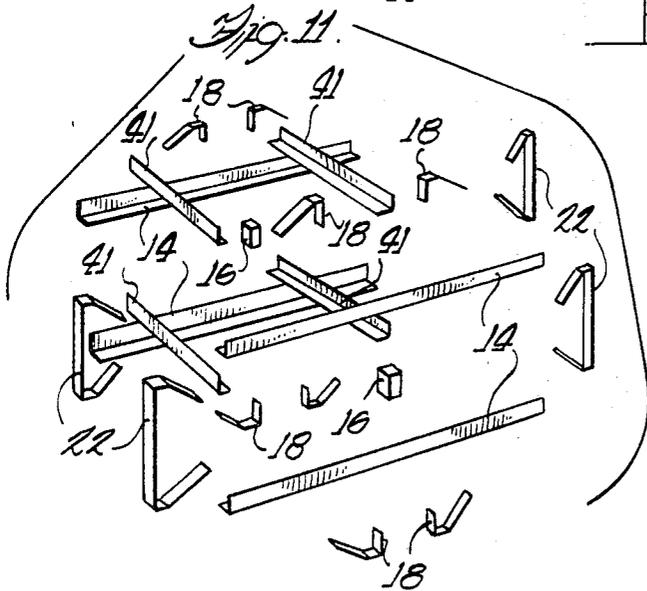
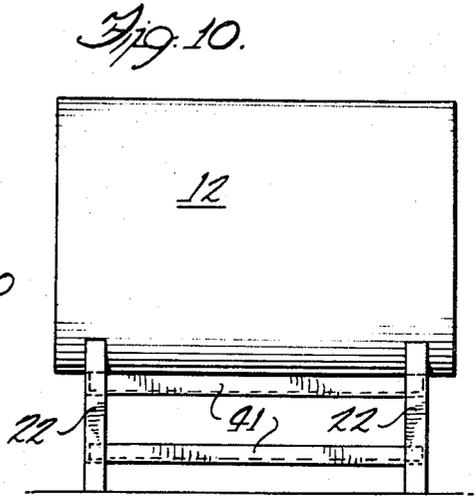
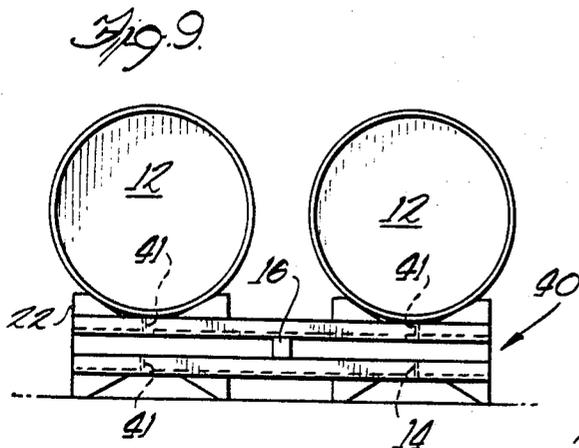
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3 Sheets-Sheet 3



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3,476,260  
**STORAGE RACK FOR CYLINDRICAL  
 CONTAINERS**

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 Filed Dec. 5, 1967, Ser. No. 688,080  
 Int. Cl. A47g 7/28, 5/00  
 U.S. Cl. 211-71

5 Claims

**ABSTRACT OF THE DISCLOSURE**

A rack for a plurality of cylindrical containers having pairs of opposed parallel side rails and parallel cross bars, the latter being secured to spacer posts which separate the parallel side rails. Intermediate chocks are provided centrally and secured to the outer faces of the parallel rails in opposed positions, and the ends of the parallel rails are covered by end chock spanners. The units are reversible, and nest in staggered relationship atop each other when no cylindrical containers are stored. Access for a fork lift truck from four directions is provided as well as for the individual removal of the cylindrical containers.

The present invention relates to a storage rack for cylindrical containers, and more particularly such a rack which can be stacked vertically with a plurality of cylindrical containers contained therein, utilizing the containers as a part of the support.

Various types of storage racks for containers have been proposed, of the character disclosed in United States Patent 3,019,916 and the prior art patents cited therein. Some such racks are detachable and have to be erected in the field. Others suffer from the disadvantage of being accessible by a fork lift truck from only one direction, or two directions at most. Furthermore, when out of operation many users prefer to nestingly stack the racks rather than disassemble the same.

In view of the foregoing, it is a principal object of the present invention to provide a storage rack for cylindrical containers which permits four way access for the tines of a fork lift truck. In addition, the preferred embodiment of the present invention hooks to a rack of the character set forth above in which a fork lift truck can not only engage the rack itself from four different directions, but the cylindrical containers on the top rack can be individually removed without disturbing the rack itself.

Another object of the present invention is to provide a safe, economical storage of large cylindrical containers which is of all welded construction, and will permit rapid inventory flow utilizing a single truck system.

Still another object of the present invention is to provide a rack for cylindrical containers which is susceptible of expansion from a two container rack to a three container rack, and further provides for a modification for lighter cylindrical containers in a less expensive construction which insures stability of the container.

Another significant object of the present invention is to provide a rack design achieving the foregoing objects which can be nestingly stored for transport or readiness in a storage yard without disassembling the same, and minimizing the space required for storage when out of use.

Further objects and advantages of the present invention will become apparent as the following description of illustrative embodiments proceeds, taken in conjunction with the accompanying drawings in which:

FIG. 1 is a perspective view of an illustrative grouping of three racks and six cylindrical containers illustrating in phantom lines the access by a fork lift truck.

FIG. 2 is a partially diagrammatic exploded view of the principal components of the illustrative rack.

FIG. 3 is an enlarged partially sectioned view illustrating the parallel cross-bar and spacer post construction.

FIG. 4 is a perspective view of the end chock spanner construction common to all of the embodiments.

FIG. 5 is a diagrammatic view in front elevation illustrating the positions for engagement by the tines of a fork lift truck, and further showing how one of the cylindrical containers can be raised from the rack without disturbing the nesting stored condition of another cylindrical container.

FIG. 6 is a top view of the preferred embodiment illustrative rack illustrating also the position and orientation of the tines of a fork lift truck for engagement therewith.

FIG. 7 is a front elevation of an alternative embodiment illustrating the use of an additional module in length and rendering the rack susceptible of storing three drums instead of two.

FIG. 8 is an end view showing the cylindrical container partially broken illustrating the entrance of the fork lift tines from the end to raise either the rack or the cylindrical container, the same being equally applicable to the two container rack illustrated in FIG. 6 or the three container rack illustrated in FIG. 7.

FIG. 9 is a front elevation of an alternative embodiment employing angle iron transverse members.

FIG. 10 is an end view of the alternative embodiment disclosed in FIG. 9.

FIG. 11 is a perspective exploded view of the principal elements of the alternative embodiment disclosed in FIGS. 9 and 10.

FIG. 12 and FIG. 13 are respectively front elevations and end views of the illustrative racks showing the nesting features applicable to the various embodiments.

In broad outline, the invention contemplates a storage rack 10 for cylindrical containers 12 in which all of the structural members are in a unitary fixed assembled relation (as generally shown in FIG. 1). Pairs of opposed parallel side rails 14 are secured by means of parallel cross-bars 15 which in turn are secured to spacer posts 16 which separate the parallel side rails 14. Intermediate chocks 18 are provided centrally and secured to the outer faces of the parallel rails 14, and the ends of the parallel rails 14 are covered by end chock spanners 22 in which the spanners provide for vertical support, close the ends of the tubular parallel side rails 14, and also provide chocking faces at the ends of the rack to thereby removably secure the cylindrical containers 12.

Turning now to FIG. 2, it will be seen that the parallel side rails 14 are tubular in construction, and four are employed. The parallel cross-bars 15 are two in number, and are preferably welded to the spacer posts 16 which serve the twofold purpose of supporting and separating the parallel rails 14 in column load, and also providing a surface for the transverse attachment of the parallel cross-bars 15.

The intermediate chock 18 is best shown in FIG. 3 where it will be seen that the same is in the configuration generally of a right triangle presenting a wedge surface or leg 19, and a support leg 20. A flattened vertex 21 is provided at the intersection between the wedge 19 and the support 20. The free ends are welded, as shown, to the parallel side rails 14. Also illustrated in greater detail in FIG. 3 is the transverse parallel cross-bar 15, secured by welding to the spacer post 16 which in turn is secured by welding to the parallel side rails 14.

As will be observed in FIG. 4, the end chock spanner 22 is in the form of an isosceles triangle having a spanner base 23 joined by a flattened face 25 to the chock or wedge members 24, the ends of which are proportioned

to slip over the ends of the parallel side rails 14. The end chock spanner 22 is then secured by welding to the open ends of the parallel side rails 14, and welding the two ends of the wedges 24 to the outer faces of the parallel side rails 14. The flattened faces 21, 25 at the ends of the chocks increase the bearing areas on compacted soils, and hence are preferable to a radiused end.

Before proceeding further with the details of alternative embodiments, it will be noted from FIG. 1 that the spacing of the spacer posts 16 and the parallel cross-bars 15 is such that in a small capacity unit, the tines are inserted in a relationship straddling the parallel cross-bars (see FIG. 5) and in a larger capacity unit, the tines 13 will fit between the parallel cross-bars 15, thus in either configuration a guide is provided for the lift truck operator so that a balanced load will be rested atop the fork lift truck tines 13. Sufficient clearance is provided between the base of the cylindrical container 12 (see FIG. 5) and the upper portion of the parallel cross-bars 15 so that the tine can enter beneath the cylindrical drum 12 and raise the same from the rack, or alternatively, slip beneath the parallel cross-bar 15 and raise the entire rack with two cylindrical containers 12 atop the rack. A further illustration of the correlative relationship between the tines 13 of a fork lift truck and the parallel cross-bars 15 is shown in FIG. 6.

FIG. 7 shows a three drum rack, differing from the embodiment just disclosed and described solely by the provision of additional spacer posts 16 and their related parallel cross-bars 15. As will be also observed in FIG. 8, the tines 13 of the fork lift truck may pass above the parallel cross-bars 15 and engage the cylindrical container 12, or pass beneath the parallel cross-bars 15 and engage the same as discussed above.

FIG. 9 discloses an alternative lightweight embodiment in which the spacer post 16 is positioned centrally of the unit, and then the parallel opposed cross-bars 41 which are formed of angle iron are secured at the approximate nesting centers of the cylindrical containers 12. The open center rack 40 thus defined is considerably lighter in weight, but does not have the space between the base of the cylindrical container 12 and the parallel opposed cross-bars 41 to permit the cylindrical container to be removed from the rack by means of the tines 13 of a fork lift truck. In certain small container applications, this is a desirable feature since engaging the cylindrical containers 12 with the fork lift truck could drop the same, and only be a proper load in the rack form. The alternative open center rack 40 embodiment is completed with an end chock spanner construction 22 with intermediate chocks 18 as in the other embodiments disclosed and described.

Turning now to FIGURES 12 and 13, without detailed description it will be noted that the racks can be criss-crossed to nestingly stack in a small space. The racks readily ride each above the other by the engagement of the respective parallel side rails 14 in the embodiment of FIG. 12, and by the engagement of the cross bars 41 with the side rails 15 as in the alternative embodiment of FIG. 13.

In review it will be seen that a rack construction for a plurality of cylindrical containers has been disclosed and described in which the central common feature is an end chock spanner 22, and pairs of opposed parallel side rails 14 joined by intermediate members, the parallel side rails 14 being spaced by spacer posts 16. Intermediate chocks 18 are provided on the outer faces of the parallel

rails 14 to complete the construction. In the preferred embodiment, entry by the tines of a fork lift truck is provided in four directions, and furthermore the drums 12 can be removed from the racks individually, and where the proper tines of the lift truck are available, they can be removed in transverse engagement or longitudinal engagement. Multiples up to three in size can be formed with common parts, as well as an embodiment for smaller containers which reduces the hazard of mechanical removal from the rack and the possibility of dropping and breakage.

While the invention has been described in connection with specific embodiments and applications, no intention to restrict the invention to the examples shown is contemplated, but rather to include within the invention all of the subject matter defined by the spirit as well as the letter of the annexed claims.

I claim:

1. A storage rack for cylindrical containers comprising, in unitary fixed assembled relation, opposed pairs of parallel side rails, opposed spacer posts intermediate the ends of the side rails separating the pairs of parallel side rails, parallel cross bars intermediate the ends of the parallel side rails in fixed relation thereto maintaining the pairs in opposed parallel relation, intermediate chocks secured to the outer portion of the side rails on rectangular centers, and end chock spanners of truncated open vertex end configuration having wedge-like shortened legs convergently extending from the spanner formed with a base spanner portion fixedly secured to the ends of each pair of parallel side rails, the shortened legs being fixed to the tops of the parallel legs to define wedge members in opposed relation to the intermediate chocks thereby securing the rail ends and providing opposed chocks for cylindrical container storage.

2. In the storage rack of claim 1, four spacer posts on rectangular centers, and two parallel cross bars secured at their ends to opposed spacer posts.

3. In the storage rack of claim 1, four angle iron cross bars secured at each end thereof to opposed parallel rails.

4. In the storage rack of claim 3, each angle iron cross bar being secured to the parallel rails at a central position between the chocks.

5. In the storage rack of claim 1, spacing between the parallel rails to permit the passage of forked lift truck tines therebetween, and spacing between the upper face of the top parallel rail and the top of the cross bars to permit the passage of forked lift truck tines therebetween, thus permitting access for lifting the rack from four directions.

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U.S. Cl. X.R.

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