March 5, 1968 T. N. D'ALTRUI 3,371,798

CANTILEVER STORAGE RACK

Filed July 11, 1966 2 Sheets-Sheet 1

FIG. 1

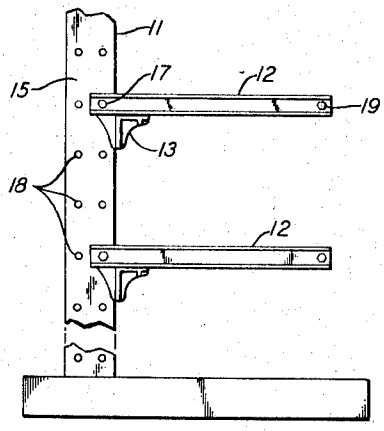


FIG. 2

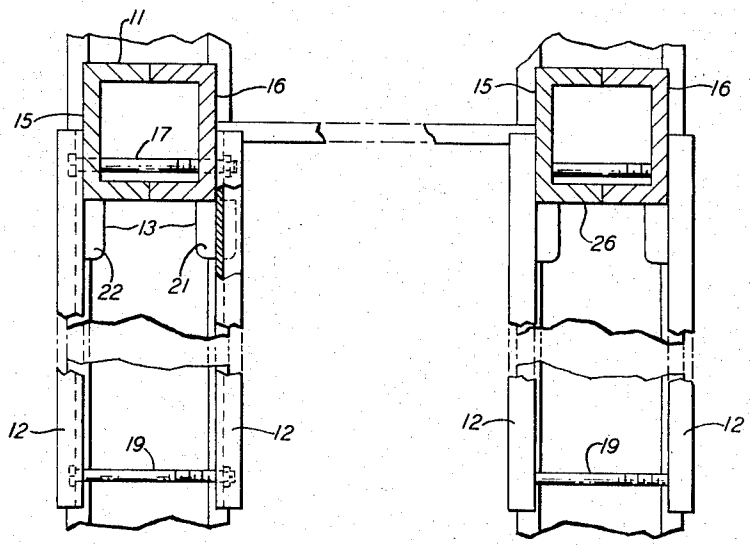
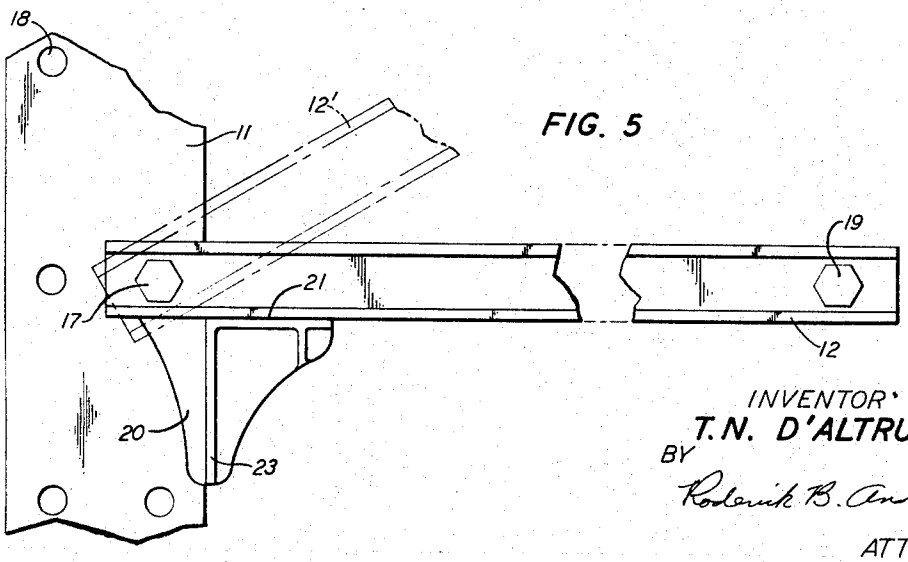


FIG. 5



INVENTOR:
T. N. D'ALTRUI
BY
Roderick B. Anderson
ATTORNEY

March 5, 1968 T. N. D'ALTRUI 3,371,798

CANTILEVER STORAGE RACK

Filed July 11, 1966 2 Sheets-Sheet 2

FIG. 3

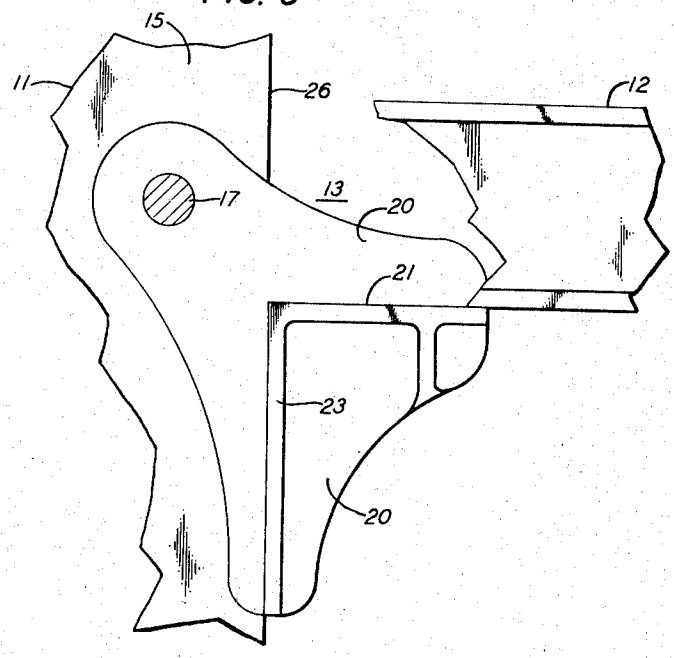
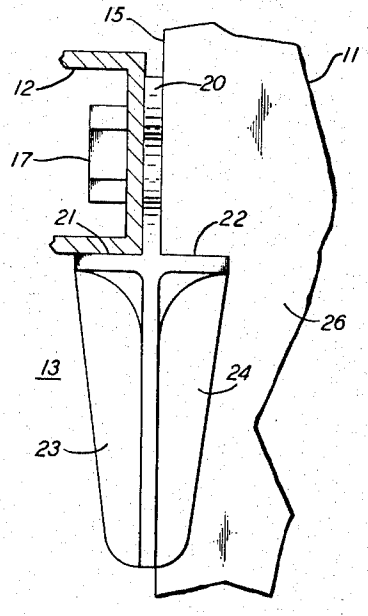


FIG. 4



United States Patent Office 3,371,798
Patented Mar. 5, 1968

3,371,798

CANTILEVER STORAGE RACK

Thomas N. D'Altrui, Union, N.J., assignor to Midland Machine Company, Elizabeth, N.J., a corporation of New Jersey

Filed July 11, 1966, Ser. No. 564,073
3 Claims. (Cl. 211—182)

This invention relates to storage racks having a cantilever construction.

Cantilever storage racks are racks having substantially horizontal load-bearing beams that are supported at only one end. These racks are particularly suitable for storage of cumbersome industrial products such as sheet steel, pipe and lumber. The user typically adjusts the spacings of the beams to his liking on vertical posts and stacks elongated material on two or more beams with a fork lift. It is evident that good cantilever racks require devices for mounting the beams to the vertical posts that are structurally strong and dependable and also easily adjusted to any desired vertical height.

When the user is attempting to move his load to or from a pair of storage rack beams with a fork lift, there is a substantial danger of bumping the beams above his load. Users tend to make inadequate estimates of the vertical spacings required between beams, and also, the fork lift usually impairs their vision.

Accordingly, the objectives of this invention are as follows:

To provide cantilever storage racks having load-supporting beams that can be easily relocated on a vertical post, while still being structurally strong and dependable.

To provide cantilevered load-supporting beams capable of absorbing sharp upward blows of the type caused by accidental operation of a fork lift.

These and other objects of the invention are attained in an illustrative embodiment thereof comprising a cantilever storage rack having a number of vertical posts. Each post is hollow with a square cross-section, opposite side walls having vertically aligned apertures. Beams are supported on the post by brackets bolted on opposite sides of the post. Each bracket has a support wall forming a right angle with a load-supporting surface on which the beam rests. The beams and brackets are arranged in pairs on opposite sides of the post with the free ends of the beams of each pair being bolted together.

The supported ends of the beams of each pair are bolted together by a single bolt extending through the corresponding pair of bracket base plates and the vertical post. The support walls of the brackets bear against a front surface of the vertical post to maintain the beams in a horizontal position and to provide a dependable load support. As will be seen more clearly later, my bracket and beam combination is easily relocated because only a single bolt need be moved, and yet it gives the support required by extremely heavy loads.

The bolted ends of the beams extend beyond the load-supporting surfaces of the brackets. If the beams are accidently struck from below they are free to pivot on the single bolt without bearing on the bracket load-supporting surface or the vertical post. This obviously avoids breakage of the rack structure and can avoid serious injury to surrounding personnel because when the accidential upward force is removed, the beams and their load simply settle back onto the bracket load-supporting surface rather than collapsing.

These and other objects, features, and advantages of my invention will be better understood from a consideration of the following detailed description, taken in conjunction with the accompanying drawing, in which:

FIG. 1 is a side view of a cantilever storage rack in

accordance with an illustrative embodiment of the invention;

FIG. 2 is an enlarged fragmentary view taken along lines 2—2 of FIG. 1;

FIG. 3 is a side view of the bracket of FIGS. 1 and 2;

FIG. 4 is a front view of the bracket of FIG. 3; and

FIG. 5 is an enlarged fragmentary side view of part of the storage rack of FIG. 1.

Referring now to FIGS. 1 and 2 there is shown a cantilever storage rack in accordance with an illustrative embodiment of the invention comprising vertical posts **11** on which are mounted beams **12** which are supported by brackets **13**. As shown in FIG. 2 the brackets and beams are arranged in pairs on opposite side walls **15** and **16** of the post. Each pair of beams and brackets is mounted by a single bolt **17** that extends through the vertical post **11**. Apertures **18** are arranged vertically in side walls **15** and **16** of the post so that the beams can be adjusted to various vertical heights and can be extended in a horizontal direction opposite that shown. The free ends of the beams **12** of each pair are fastened together by bolts **19**. The purpose of the rack is to store elongated materials such as pipe and lumber that are supported by adjacent pairs of cantilever beams.

Referring now to FIGS. 3 and 4, each bracket comprises a base plate **20**, a pair of load-bearing walls **21** and **22**, on opposite sides of the base plate, and a pair of support walls **23** and **24** each of which forms an L with one of the load-supporting walls. An aperture **25** in the base plate is adapted to receive the bolt **17** of FIG. 2. When mounted on side walls **15** of the vertical post the bracket support wall **24** bears on a front wall **26** of the post, while load-bearing wall **21** supports the cantilever beam. The front of the bracket is made symmetrical as shown in FIG. 4, so that it can be mounted on either side wall of any of the posts. For example, if the bracket of FIG. 4 were mounted on the opposite side wall **16** of the post, support wall **23** would bear on the front post wall and load-bearing wall **22** would support the beam, as is seen more clearly in FIG. 2.

As shown in FIG. 5, an important feature of the invention is that bolt **17** is located behind the bracket load-bearing wall **21**. This permits beam **12** to pivot upwardly in response to a sharp upward force as illustrated by the beam position **12'**. If the load-bearing wall extended backwardly as far as bolt **17**, it would interfere with rotation of the beam and probably break if the beam were accidently struck from below.

Examination of the bracket of FIG. 5 illustrates its capacity to bear a heavy load. The load-bearing walls **21** and **22** are sufficiently reinforced to prevent downward bending. The bolt **17** is arranged so that it would necessarily shear, rather than pull out, if subjected to over-load. An extremely high torque would be required to bend the support walls **23** and **24** that bear on the vertical post. Hence, if the beams and brackets are made of the same size stock, it would usually be the beams, rather than the brackets, that would limit load weight. Yet, the entire assembly of each pair of brackets and beams can be conveniently relocated by moving only a single common bolt. The brackets of course are completely interchangeable. As mentioned before, the pivoting feature illustrated in FIG. 5 removes most of the danger of loading the cantilever storage rack with a fork lift. If a fork lift is used to place a load on the lower beams **12** of FIG. 1, and the upper beams are accidently struck, they will simply pivot upwardly, rather than breaking and collapsing with their entire load.

The embodiment shown is intended to be merely illustrative of the principles of the invention. Indeed, one of the advantages of the invention is its flexibility in permit-

ting cantilever racks of various configurations to be formed from any of a number of vertical posts and beams. Various other modifications and embodiments may be made by those skilled in the art without departing from the spirit and scope of the invention.

What is claimed is:

1. A storage rack comprising:

a plurality of vertical posts each having first and second abutting walls at right angles;

a plurality of vertically arranged first apertures in the post second wall;

a bracket mounted on each post comprising a base plate part of which is mounted flush against the post second wall and part of which extends from the post second wall beyond the first wall;

the bracket further including a first support wall extending transversely from one side of the base and being flush with the post first wall, and a first load-bearing wall extending transversely from the base plate at substantially a right angle with respect to the first support wall;

a cantilever beam resting on the first load-bearing wall and having a second aperture near one end;

the bracket base plate having a third aperture;

and a bolt extending through one of the first apertures, the second aperture and the third aperture, whereby the cantilever beam is supported in a horizontal position by the bolt and the first load-bearing wall, and the bracket is supported by the bolt and the post first wall which bears against the first support wall of the bracket;

the bolt being located farther from the post first wall than any part of the first load-bearing wall, whereby the cantilever beam is free to pivot about the bolt if an upward force is exerted thereon.

2. The storage rack of claim 1 wherein:

each vertical post includes a post third wall abutting at right angles to the post first wall and being parallel to and coextensive with the post second wall;

the post third wall includes vertically aligned third apertures;

each bracket includes a second support wall coextensive with the first support wall but on the opposite side of the base plate and a second load-bearing wall coextensive with the first load-bearing wall but on the opposite side of the base plate, whereby each bracket is adapted to be bolted to either the post second or third walls.

3. The storage rack of claim 2 wherein:

the brackets and cantilever beams are mounted in aligned pairs, one bracket of each pair being secured to the post second wall and the other bracket being secured to the post third wall;

each pair of brackets and beams are secured to the post by only a single bolt extending therethrough;

the free ends of the cantilever beams of each pair are bolted together;

and each bracket and beam pair is mounted at the same vertical height as the bracket and beam pairs of an adjacent vertical post.

References Cited

UNITED STATES PATENTS

1,468,478	9/1923	Keffer	248—245 XR
3,043,290	7/1962	Smith	248—245 XR
3,335,992	8/1967	Frazier	248—245

FOREIGN PATENTS

588,686	5/1947	Great Britain.

ROY D. FRAZIER, *Primary Examiner.*

WILLIAM D. LOULAN, *Assistant Examiner.*