

[72] Inventor **Thomas N. D'Altrui**
 Union, N.J.
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 [73] Assignee **Midland Machine Corporation**
 Elizabeth, N.J.
 a corporation of New Jersey

[56] References Cited		UNITED STATES PATENTS	
1,565,735	12/1925	Greenhut	248/265
2,896,898	7/1959	Penn	248/245
3,217,833	11/1965	Smith	248/228X
3,335,992	8/1967	Frazier	248/245

Primary Examiner—Roy D. Frazier
Assistant Examiner—J. Franklin Foss
Attorney—Roderick B. Anderson

[54] **CANTILEVER STORAGE RACK**
 11 Claims, 8 Drawing Figs.
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 108/148, 108/152, 211/176, 248/228
 [51] Int. Cl. **A47F 5/00**
 [50] Field of Search **248/235,**
 241, 243, 244, 845, 228, 72; 108/152, 148;
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ABSTRACT: A cantilever storage rack section comprises a vertical post having flat side walls joined by a central web. A bracket for supporting a horizontal load-bearing member comprises two overlapping portions and is clamped onto one side wall of the vertical post by a bolt extending through the overlapping portions. One of the overlapping portions includes a plurality of apertures interconnected by a slot, and the other portion contains a threaded aperture, whereby the width of the bracket may be adjusted by registering different apertures of the two bracket portions.

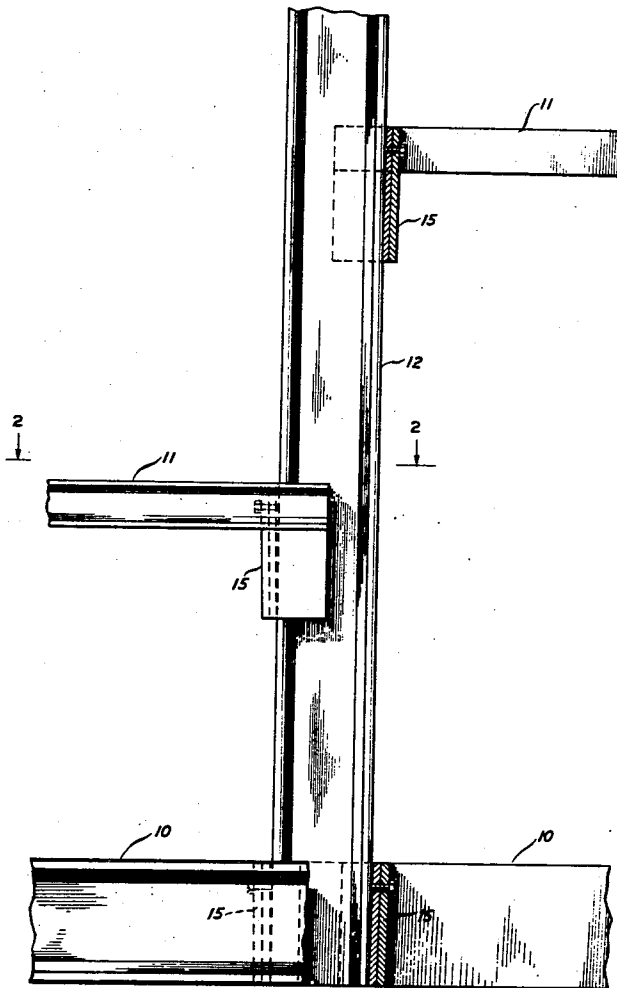
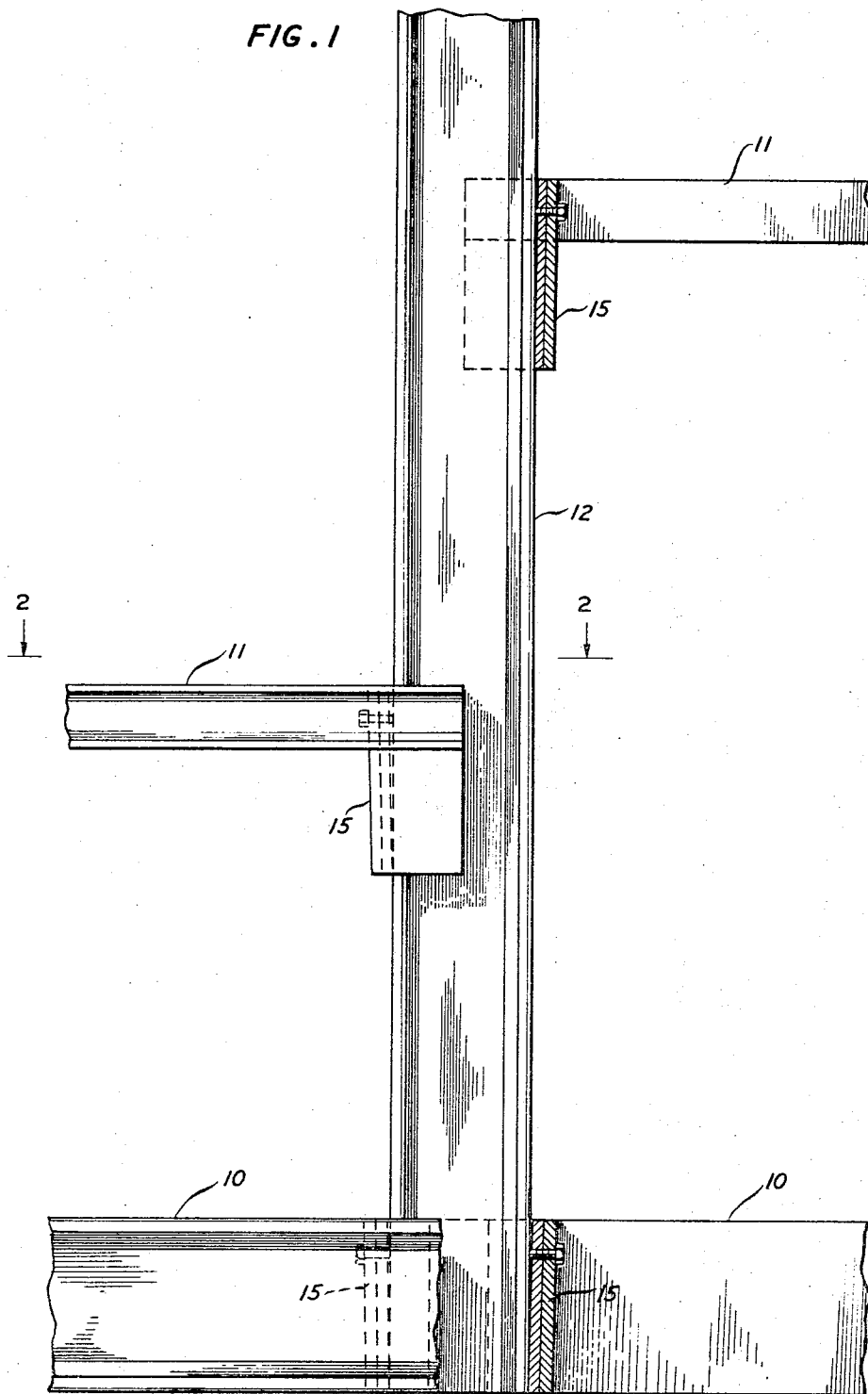


FIG. 1



INVENTOR
T. N. D'ALTRUI

BY
Robert B. Anderson
ATTORNEY

FIG. 5

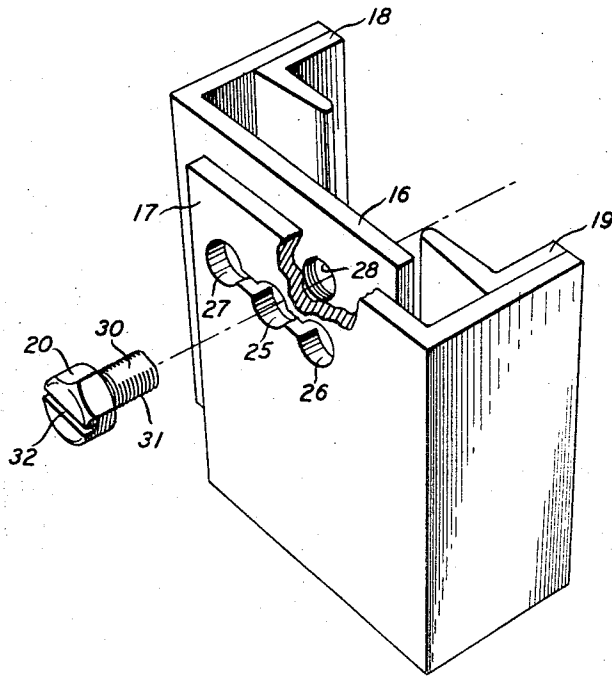


FIG. 6

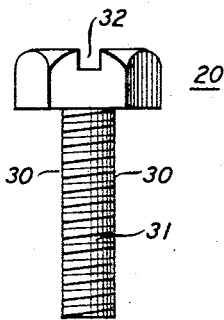


FIG. 7

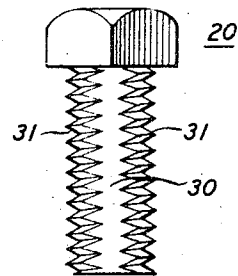
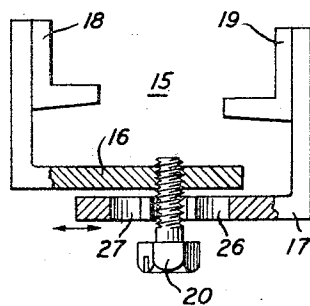


FIG. 8



CANTILEVER STORAGE RACK

BACKGROUND OF THE INVENTION

This invention relates to industrial storage racks, and more particularly, to cantilever storage racks.

Industrial cantilever storage racks comprise a plurality of horizontal load-bearing members, each of which are mounted at only one end to a vertical post. Because of this construction, cantilever racks offer several advantages; for example, they can conveniently be loaded by a fork lift truck.

Most industrial storage racks are demountable and to some extent adjustable because it has long been recognized that different structures are required for different storage rack uses. For example, the spacing between adjacent vertical posts can often be adjusted to conform to the shape and weight of the load. Likewise, each vertical post typically includes an array of mounting apertures for permitting the load-bearing members or supporting arms to be mounted at any of a number of vertical positions.

One problem, however, with such racks is that, in order to increase the number of available mounting positions for the supporting arms, one must correspondingly increase the number of mounting apertures in the vertical posts, which tends to weaken the vertical post. Another problem is that there is often little or no flexibility in the choice of the size of vertical post that can be used in constructing the storage rack. Ordinarily it is desirable to construct a rack having the lightest weight components, such as vertical posts, consistent with the load requirements to be met.

SUMMARY OF THE INVENTION

It is an object of this invention to increase the flexibility of assembly of cantilever storage racks.

It is another object of this invention to simplify the assembly of cantilever storage racks. It is an object of one feature of this invention to provide a bracket that may be used for mounting a support arm of a cantilever storage rack, which is conveniently adjustable to any of various widths.

These and other objects of the invention are attained in an illustrative embodiment thereof which is a cantilever storage rack section comprising a vertical I-Beam to which a plurality of supporting arms may be mounted by a bracket that can be adjusted to any desired vertical location on the I-Beam. The bracket comprises overlapping front portions through which a bolt is threaded to make contact with one surface of an I-beam sidewall. Rear portions of the bracket clamp firmly about the I-beam sidewall as the bolt is threaded against the I-beam. The bolt is advantageously located in an upper part of the bracket so that when a load is applied to the supporting arm, a lower part of the bracket binds against the I-beam as will be explained later. The bracket can be located at any desired vertical position by merely backing off the bolt, manually sliding the bracket, and then again tightening the bolt.

In accordance with another feature of the invention, one of the overlapping bracket sections contains a plurality of apertures interconnected by a slot, while the other bracket section contains only a single threaded aperture through which the bolt extends. The bolt comprises opposite flat surfaces and opposite threaded surfaces. When the flat surfaces are arranged parallel to the slot, the width of the bracket can be adjusted by moving the slotted bracket portion to register any of its apertures with the threaded aperture. When the bolt is tightened, it is threaded such that its flat surfaces are perpendicular to the slot, in which position the bracket is locked against any sidewise movement. It can be appreciated that the bolt performs the dual function of locking together the two portions of the adjustable-width bracket, and also clamping the bracket to the vertical I-beam post.

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

DRAWING DESCRIPTION

FIG. 1 is a partially sectioned view of a cantilever storage rack section in accordance with an illustrative embodiment of the invention;

FIG. 2 is a view taken along lines 2-2 of FIG. 1;

FIG. 3 is a view taken along lines 3-3 of FIG. 2;

FIG. 4 is a view taken along lines 4-4 of FIG. 2;

FIG. 5 is a schematic exploded view of part of the bracket of

FIG. 1;

FIGS. 6 and 7 are side views of the bolt of FIG. 4; and

FIG. 8 is a sectional view of the bracket of FIG. 4.

DETAILED DESCRIPTION

Referring now to FIG. 1, there is shown a cantilever storage rack section comprising base members 10 and a plurality of horizontal load-bearing members 11 mounted on a vertical post 12. A plurality of rack sections are interconnected in a known manner so that a load may be supported on adjacent members 11. Racks of this type are often favored because pallet-supported loads can conveniently be transferred to them by a forklift truck; alternatively, appropriate shelving may extend between adjacent load-bearing members. The base members 10 of course stabilize the rack as loads are lifted to and from the rack.

Referring to FIGS. 2, 3, and 4, the load-bearing members 11 may comprise a pair of U-shaped members 13 connected at their free ends by a connecting member 14. In accordance with the invention, the load bearing member 11 is supported on the vertical post 12 by a bracket 15 comprising overlapping front portions 16 and 17 to which are respectively welded rear portions 18 and 19. A bolt 20 extending through apertures in the overlapping portions 16 and 17 clamps the bracket onto a sidewall 22 of the vertical post 12. The aperture in portion 16 is threaded such that, as the bolt abuts against a front surface of the sidewall 22, the rear portions 18 and 19 are caused to bear against rear surfaces of the sidewall.

Referring to FIG. 3, the bolt is located in an upper part of the bracket so that as it is abutted against the vertical post 12, it forces the bracket to bear firmly against the post at location B. It can be appreciated that when a load is applied to the load bearing-members, the resulting downward force tends to bear even more firmly against the vertical post at point B, and this in conjunction with the clamping action of rear portions 18 and 19 binds the bracket firmly to the vertical post so that it cannot slide downwardly. On the other hand, with the load removed, the load-bearing member can be adjusted to any desired vertical location by merely backing bolt 20 away from the vertical post and sliding the load-bearing member and its attached bracket to the desired position.

Another advantage of the storage rack section as described thus far is that it makes use of components that are easily fabricated and which maximize structural strength per unit of weight. Notice for example, that portions 16, 17, 18, and 19 are standard L-shaped members. The rear portion 18 is welded on one side of a transverse wall of front portion 16, while the U-shaped load-bearing member 13 is welded to the other side of the transverse wall. Thus, it can be seen that the bracket and load-supporting arms can be made with standard structural steel components without the necessity of forming unique nonstandard components. The bracket is especially designed for use with I-beam or H-beam vertical posts which are advantageous for supporting heavy loads. Finally, the bracket is designed such that load bearing members can be mounted on both side walls of an I-beam so that they extend in opposite directions from the I-beam vertical post as shown in FIG. 1. The base members 10 are substantially identical to the load-bearing members except that they have a longer vertical dimension to accommodate the bracket 15 while being flush with the bottom of post 12.

Referring to FIG. 5, it can be seen that the bracket front portion 17 has three apertures 25, 26 and 27 interconnected

by a slot, while front portion 16 has only a single threaded aperture 28. The bracket is made in two portions so that its width may be adjusted by registering any of the apertures 25, 26, and 27 with the threaded aperture 28. For example, if the bracket width is to be increased, aperture 27 should be registered with threaded aperture 28, while if its width is to be reduced, aperture 26 should be so registered. With the three apertures 25, 26 and 27, the bracket can be adjusted to accommodate vertical posts of three different sizes. This is of course useful for optimizing the size of the rack components to be used.

Referring to FIGS. 6 and 7, the bolt 20 has opposite flat surfaces 30 and opposite threaded surfaces 31. The thickness of the bolt between opposite flat surfaces 30 is chosen to be smaller than the width of the slot interconnecting apertures 25, 26, and 27, while the thickness of the bolt between opposite threaded surfaces 31 is larger than the width of the slot. Hence, by arranging the bolt such that its flat surfaces 30 are parallel to the slot, the front portion 17 may be moved sideways, as shown by the arrow of FIG. 4, without removing the bolt 20 from the threaded aperture 28.

It can be appreciated that, since the bolt need never be removed from threaded aperture 28, the bolt always secures together the two portions 16 and 17 of the bracket. The bolt performs a dual function, however, in that it also clamps the bracket to the vertical post as was described before in connection with FIGS. 1 and 2.

The head of bolt 20 advantageously contains an index line 32, parallel to surfaces 30 of the bolt, for indicating to the operator the orientation of the bolt. For example, if it is desired to adjust the width of the bracket, the operator rotates bolt 20 until index line 32 is horizontal, which indicates that portion 17 is movable horizontally with respect to portion 16. When the bracket is clamped into position on the vertical post, the operator rotates the bolt until the index line is in its vertical position, which insures that the front portion 17 is locked against any motion with respect to bracket portion 16.

From the foregoing, it can be seen that my storage rack maximizes structural strength by permitting I-beams to be used as the vertical posts and by eliminating apertures in the vertical post for giving vertical adjustment. The components are made from standard elements and are easy to fabricate. The unique bracket permits vertical adjustment of the load-bearing members to an infinite number of locations. The bracket is also adjustable to accommodate posts of varying widths and is easy to operate because a single bolt performs the dual function of giving bracket width adjustment and of clamping the bracket to the post. Moreover, the bolt need not be removed during width adjustment. It is of course contemplated that a complete rack assembly include a number of vertical posts each having a number of horizontal load-bearing members that can extend from opposite sides of the post.

The foregoing embodiment is intended to be only illustrative of the principles involved. Various other embodiments and modifications may be made by those skilled in the art without departing from the spirit and scope of the invention.

I claim:

1. A cantilever storage rack section comprising:
 - a vertical post;
 - a bracket comprising first and second overlapping front walls and first and second rear walls;
 - a first transverse wall interconnecting the first front wall and the first rear wall and a second transverse wall interconnecting the second front wall and the second rear wall;
 - the rear walls being in contact with a rear surface of the post and one of the front walls being in contact with the front surface of the post;
 - a first substantially horizontal load-bearing member bonded to the first transverse wall and extending from the bracket, and a second substantially horizontal load-bearing member bonded to the second transverse wall and extending from the bracket, said load-bearing members being located near an upper edge of the bracket;

a bolt located between said load-bearing members and extending through circular openings in the overlapping front walls and abutting against the front surface of the post; and

said openings being located in an upper portion of the bracket, and at least one of the openings being threaded, whereby advancement of the bolt secures together the two overlapping front walls of the bracket and clamps a lower edge of the bracket to the post.

2. The storage rack of claim 1 wherein: the first front wall contains a plurality of first circular openings, whereby the width of the bracket may be adjusted by registering any of the first openings with the opening in the second front wall.

3. The storage rack of claim 2 wherein:

the first circular openings are interconnected by a slot; and the bolt has a narrow dimension defined between opposite flat surfaces that is smaller than the width of the slot, and a thick dimension defined between opposite threaded surfaces which is larger than the width of the slot, whereby the bolt may be moved through the slot to communicate with any of the first circular openings by rotating it such that its flat surfaces are parallel to the slot, and may be locked in any of the openings by rotating it such that its flat surfaces are perpendicular to the slot.

4. The storage rack of claim 1 wherein: the rear walls of the bracket each constitute part of an angle member having a wall perpendicular to the rear wall which is bonded to an inner surface of the transverse wall of the bracket.

5. The storage rack of claim 4 wherein:

the first front wall and first transverse wall together constitute an integral angle member having flat surfaces; and the second front wall and second transverse wall constitute a second integral angle member having flat surfaces.

6. The storage rack of claim 4 wherein: the load-bearing member comprises two U-shaped members which are respectively bonded to the outer surface of the first and second transverse walls of the bracket.

7. The storage rack of claim 6 wherein: the first front wall contains a plurality of first circular openings, whereby the width of the bracket may be adjusted by registering any of the first openings with the opening in the second front wall.

8. The storage rack of claim 7 wherein:

the first circular openings are interconnected by a slot; and the bolt has a narrow dimension defined between opposite flat surfaces that is smaller than the width of the slot and a thick dimension defined between opposite threaded surfaces which is larger than the width of the slot, whereby the bolt may be moved through the slot to communicate with any of the first circular openings by rotating it such that its flat surfaces are parallel to the slot, and may be locked in any of the openings by rotating it such that its flat surfaces are perpendicular to the slot.

9. The storage rack of claim 8 wherein: the end of the bolt opposite the vertical post contains an index line, whereby an operator can ascertain whether the flat surfaces of the bolt are parallel to the slot.

10. An adjustable width bracket comprising:

- a first member comprising a first front wall and a perpendicular transverse wall;
- a second member comprising a second front wall and a second transverse sidewall, said first and second transverse sidewalls being adapted to clamp against opposite sides of an object;
- the second front wall overlapping the first front wall and having a plurality of circular openings joined by a slot;
- the first front wall having a threaded opening in that portion which is coextensive with the second front wall;
- a bolt extending through the circular openings in the overlapping front walls; and
- said bolt having a narrow dimension defined between opposite flat surfaces that is smaller than the width of the slot and a thick dimension defined between opposite threaded surfaces which is larger than the width of the

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slot, whereby the bolt may be moved through the slot to communicate with any of the first circular openings by rotating it such that its flat surfaces are parallel to the slot and it may be locked in any of the openings by rotating it such that its flat surfaces are perpendicular to the slot.

11. The bracket of claim 10 wherein:
the bolt comprises an enlarged end portion having a diame-

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ter that is greater than the diameter of any of the slots; and
the end of the enlarged portion contains an index line parallel to the flat surfaces of the bolt, whereby an operator can ascertain whether the flat surfaces are parallel to the slot.

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