United States Patent

[11] **3,570,682**

[72] Inventor **Michael M. Elliott**
Indianapolis, Ind.

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[73] Assignee **Elliott-Williams Company, Inc.**
Indianapolis, Ind.

[54] **RACK AND SHELVING SYSTEM**
9 Claims, 13 Drawing Figs.

[52] **U.S. Cl.** **211/126**
[51] **Int. Cl.** **A47f 3/14**
[50] **Field of Search** 211/126, 162; 108/105, 106, 107, 108, 109, 110

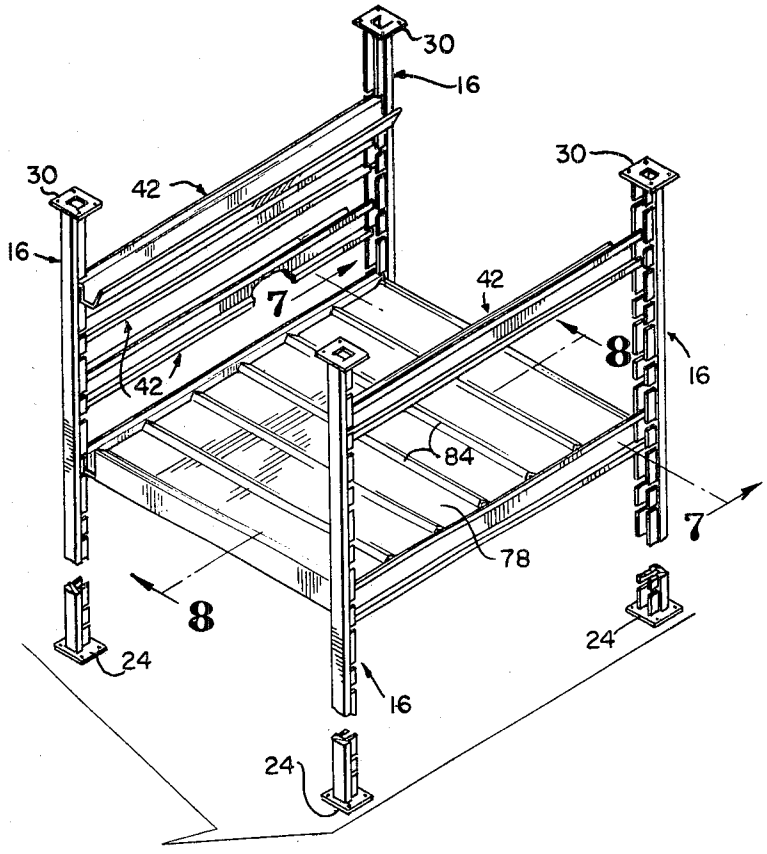
[56] **References Cited**

UNITED STATES PATENTS

1,681,218	8/1928	Carlson	108/110
2,005,593	6/1935	Onions	108/109
2,359,109	9/1944	Hormes	108/109X
3,169,640	2/1965	Favre	211/126
3,199,683	8/1965	Graswich	211/126X
3,222,117	12/1965	Schwartz	211/126X
3,297,075	1/1967	Howell	211/162X
3,498,239	3/1970	Bartlett	108/110

Primary Examiner—Nile C. Byers, Jr.
Attorney—Hood, Gust, Irish, Lundy & Coffey

ABSTRACT: A rack system for receiving and supporting items such as trays, pans, shelves, and the like comprising at least two pairs of vertically extending standards and a plurality of guide members extending between and connected to each pair of standards. Each end of each guide member is formed to provide upper and lower hook portions which engage, respectively, vertically spaced apart notches in a flange of the standard to which the end is connected. Each standard is preferably provided with a base plate so that it can be rigidly fastened to a floor. The upper end of each standard is preferably connected to a ceiling by means of a connector plate. Each standard is preferably a channel member, both flanges of which are provided with notches arranged to engage the said hook portions of a guide member.



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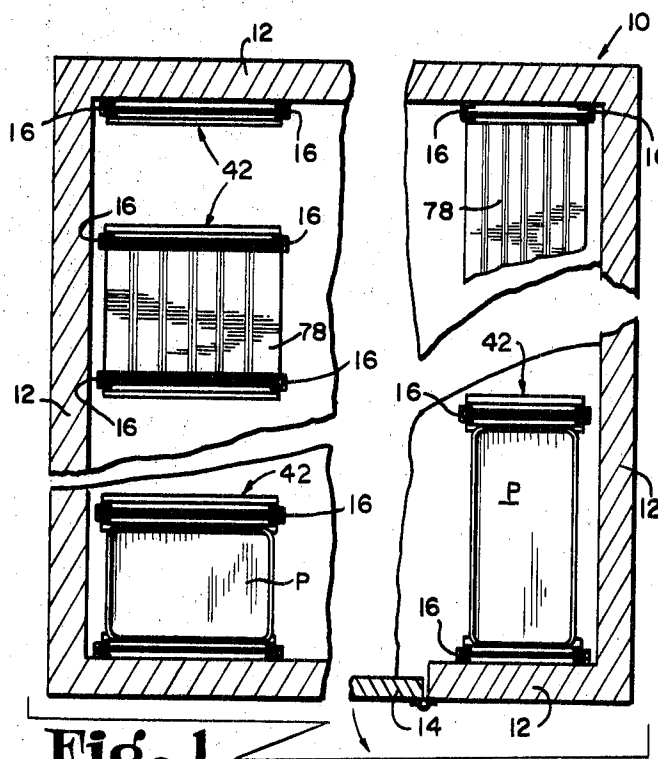

Fig. 1

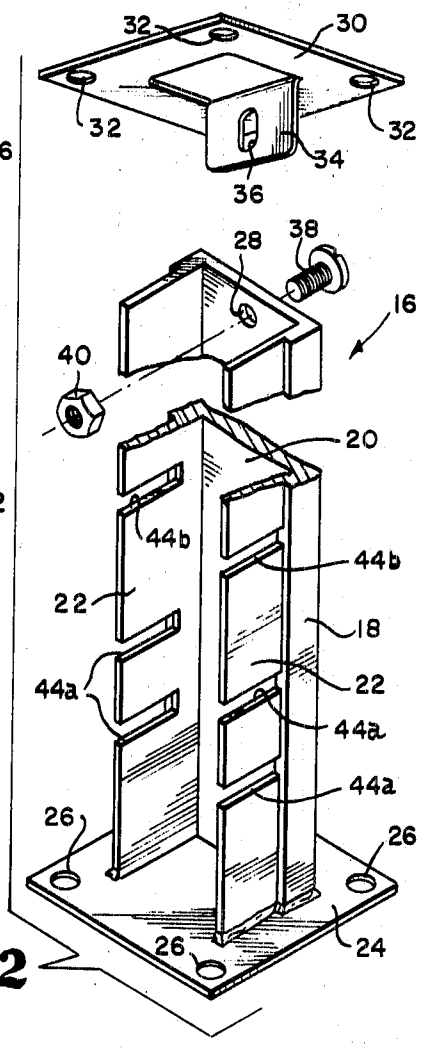

Fig. 2

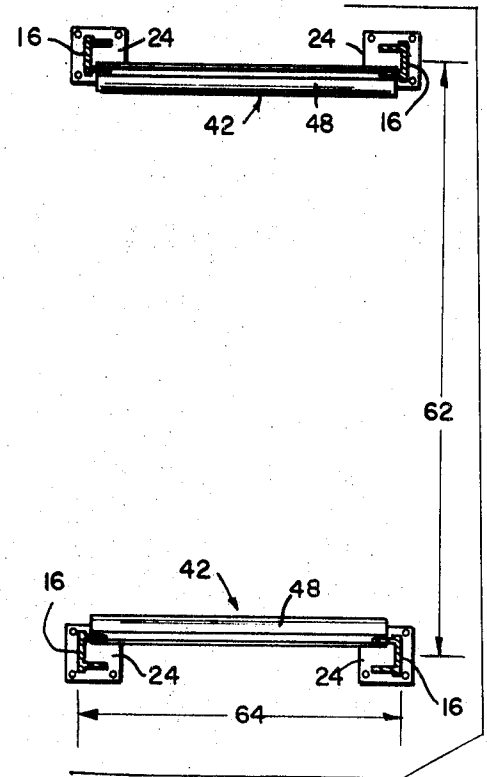

Fig. 3

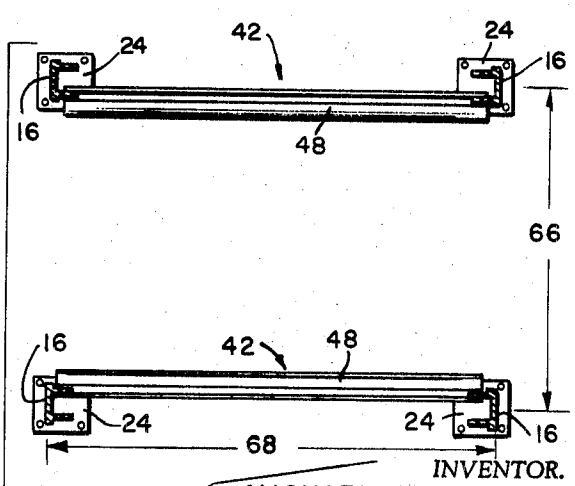

Fig. 4

INVENTOR.
MICHAEL M. ELLIOTT

BY
Hood, Gust, Irish & Lundy
ATTORNEYS

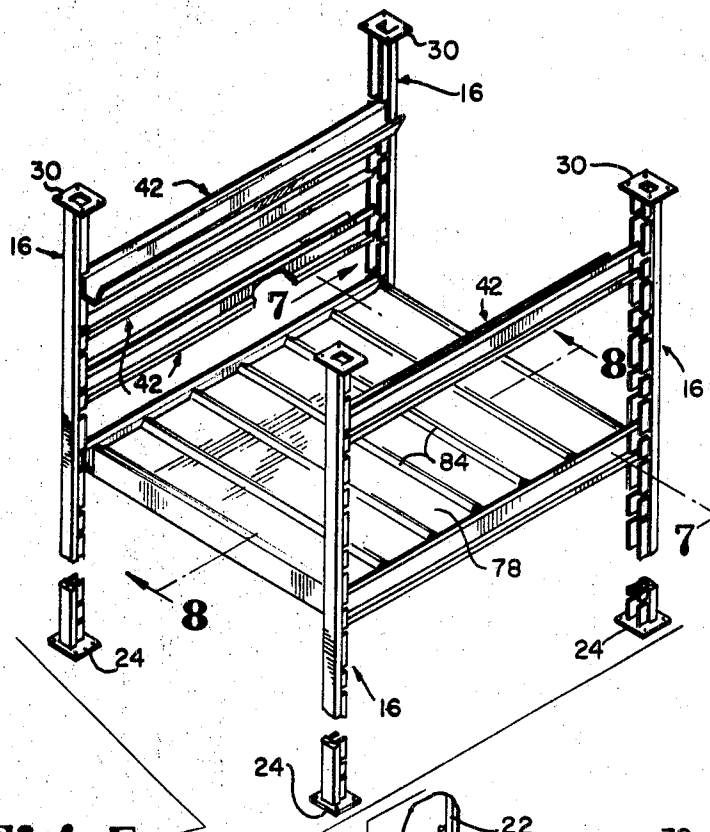

Fig. 5

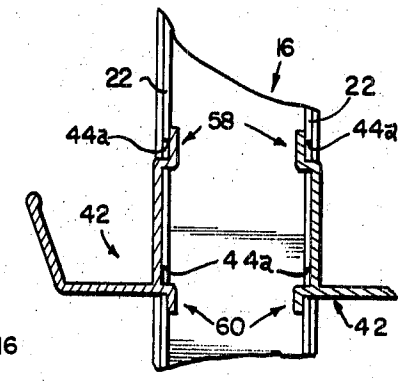

Fig. 6

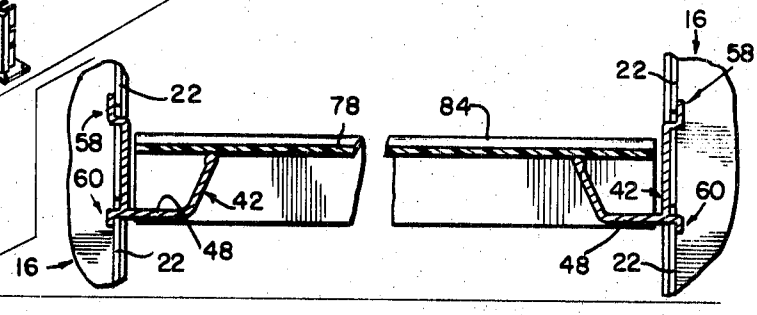

Fig. 7

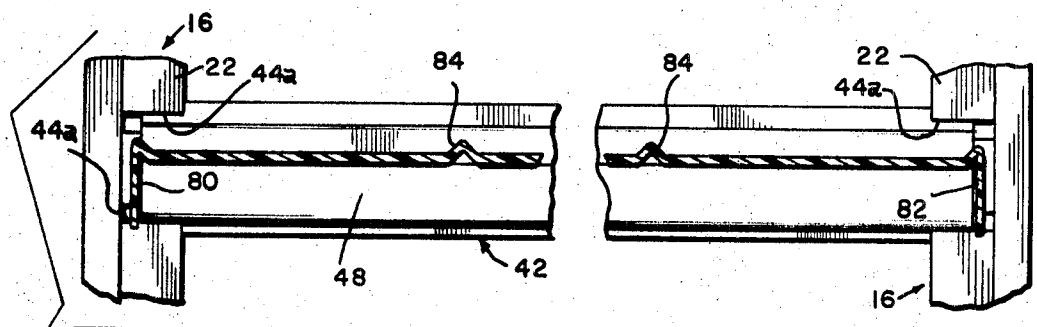

Fig. 8

INVENTOR.
MICHAEL M. ELLIOTT

BY
Wood, Gust, Irish & Lundy
ATTORNEYS

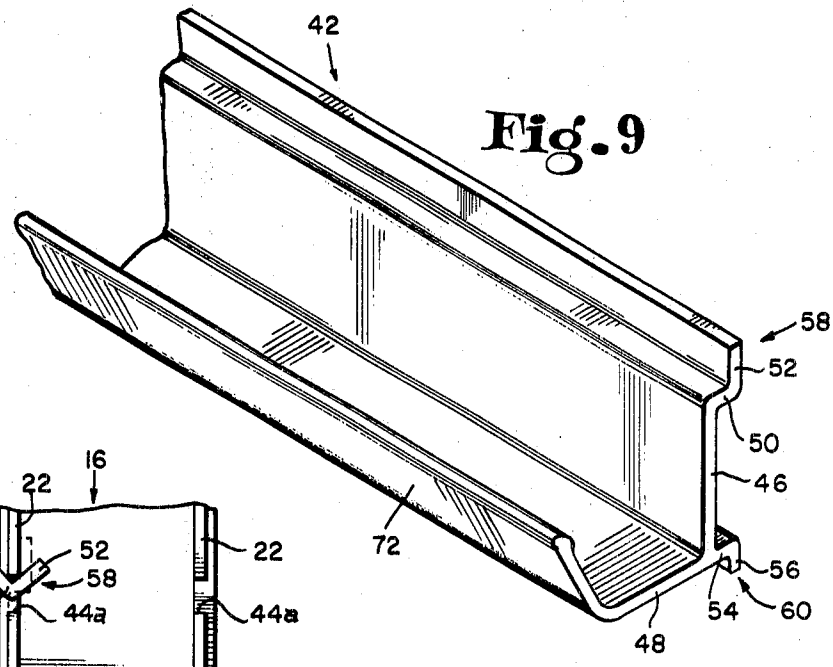

Fig. 9

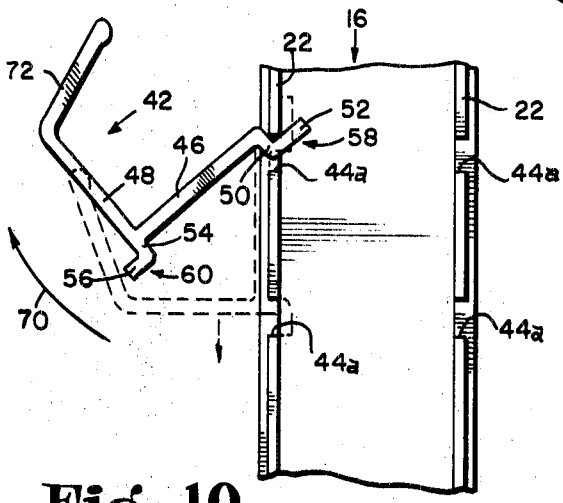

Fig. 10

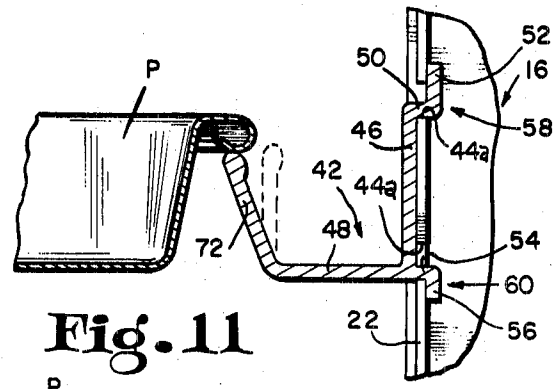

Fig. 11

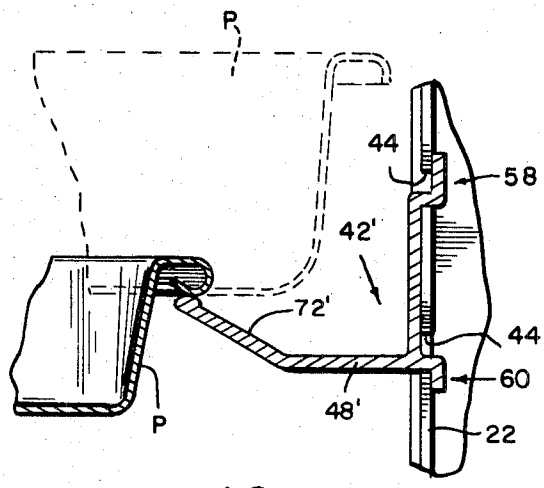

Fig. 13

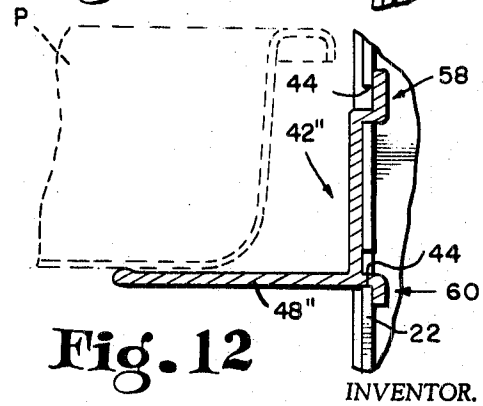

Fig. 12

INVENTOR.
MICHAEL M. ELLIOTT
BY
Wood, Gust, Irish & Lundy
ATTORNEYS

RACK AND SHELVING SYSTEM

It is a primary object of my invention to provide a rack system for receiving and supporting items such as pans, trays, shelves, and the like, which system is ideally suited for use in a storage area such as a walk-in refrigerator or freezer. My rack system comprises a plurality of vertically extending standards, each of which is connected at its base to the floor and, at its upper end, to the ceiling. These standards are proportioned and designed so that a plurality of horizontally extending guide members or guide rails can be mounted on the standards to provide a plurality of laterally spaced apart, horizontally extending runners for supporting opposite side edges of trays, pans, shelves and the like.

The ordinary or conventional commercial food tray or bun pan as used in bakeries, restaurants, cafeterias and the like is a simple, flat, rectangular sheet metal pan having an upwardly and outwardly inclined flange about its perimeter, the upper edge of the flange being provided with an outwardly and downwardly turned lip or rim. These trays and pans have different depths, depending upon their intended use. A typical bun pan or cake pan may be, for instance, approximately 1 inch deep while a steam table or roast pan may be more than 6 inches deep. There have been many attempts throughout the food equipment industry to standardize on the size of trays and pans. These attempts have not been completely successful and, consequently, it has been a problem in the past to provide a rack system which will accommodate all of the pans and trays being used by restaurants. Thus, one object of my invention is to provide a rack system which is designed to support the wide variety of trays and pans being used in restaurants.

Another object of my invention is to provide a rack system which can be easily installed in a confined area, such as a walk-in refrigerator, with simple and readily available hand tools. It is my concept to provide vertically extending standards which are uniform in size and shape and which can be arranged in pairs and fastened to the floor and to the ceiling of a walk-in refrigerator. Each of these standards is formed with at least one vertically extending flange which is provided with vertically spaced apart, horizontally extending notches entering its outer edge. Two pairs of such standards are arranged so that the flanges of each pair lie generally in a common plane with the notches extending into the facing edges of the flanges and with corresponding notches in the flanges positioned at substantially the same elevation. I then provide a plurality of guide members proportioned and designed to extend between each pair of standards and to be removably connected thereto by means of the notches. Specifically, I provide a plurality of guide members, each of which is formed with an upwardly and longitudinally extending first flange portion and forwardly and longitudinally extending second flange portion. Each first flange portion provides, at each of its ends, an upper hook portion and a lower hook portion proportioned and designed respectively to engage two spaced apart notches in a flange of a standard. These hook portions and the notches in which they are engaged are proportioned and designed so that the end of a guide member can be disconnected from the standard to which it is connected only by lifting the guide member vertically upwardly to disengage its lower hook portion and then rocking it about a longitudinally extending axis to disengage its upper hook portion.

Other objects and features of my invention will become apparent as this description progresses.

To the accomplishment of the above and related objects, my invention may be embodied in the forms illustrated in the accompanying drawings, attention being called to the fact, however, that the drawings are illustrative only, and that change may be made in the specific constructions illustrated and described, so long as the scope of the appended claims is not violated. In the drawings:

FIG. 1 is a fragmentary, sectional, elevational view of a walk-in refrigerator showing my rack system disposed therein;

FIG. 2 is an exploded perspective view, partially broken away, showing my preferred standard and the means by which it is connected to a floor and to a ceiling;

FIG. 3 is a diagrammatical view showing how two pairs of my standards and guide members may be arranged to support the ends of a conventional bun pan;

FIG. 4 is another diagrammatical view showing how two pairs of my standards and guide members may be arranged to support the sides of such a bun pan;

FIG. 5 is a fragmentary perspective view showing two pairs of my standards, guide members extending between each pair and a shelf mounted on corresponding guide members;

FIG. 6 is a fragmentary, sectional view showing the manner in which guide members may be connected to each of the flanges of a standard;

FIG. 7 is a sectional view taken from FIG. 5 generally along the line 7–7;

FIG. 8 is a sectional view taken from FIG. 5 generally along the line 8–8;

FIG. 9 is a fragmentary perspective view of a guide member;

FIG. 10 is a fragmentary elevational view showing how the guide member of FIG. 9 is removably connected to a standard;

FIG. 11 is a fragmentary sectional view showing the guide member of FIG. 9 supporting the edge of a pan;

FIG. 12 is a fragmentary sectional view showing a different type of guide member which provides a generally flat flange-type runner for supporting the lateral edge of a pan; and

FIG. 13 is another fragmentary, sectional view showing still another guide member which provides a flange arranged either to support the rim of a pan or the lateral edge of the bottom of a pan.

Referring now to the drawings, it will be seen that, in FIG. 1, I have illustrated a walk-in refrigerator 10 including four walls 12 and a door 14. In this refrigerator 10, I have arranged a plurality of vertically extending standards 16, each of which is fastened to the floor and to the ceiling. Referring to FIG. 2, it will be seen that my preferred standard 16 is a channel member 18 formed to have a connecting web 20 and a pair of vertically extending flanges 22. I prefer that the channel member 18 be an extruded aluminum channel member. It will be seen that the web 20 and the portions of the flanges 22 adjacent the web are considerably thicker than the distal edges of the flanges 22. This thickness provides the necessary strength.

I prefer to weld or otherwise rigidly to fasten a base plate 24 to the bottom end of each standard 16, this base plate being perforated as indicated at 26. The bottom end of the standard can be mounted on and connected to a floor by driving fastening elements through the perforations 26. The base 24 may be a flat, aluminum plate which is, for instance, 3 inches by 3 inches square. Such a plate will provide a suitable bearing surface for a standard 16 used in a conventional walk-in refrigerator application.

I prefer to provide a perforation 28 in the upper end of the web 20 of each standard 16. Then, I provide a connector plate 30 which is perforated as indicated at 32 and which is fastened to the ceiling of a walk-in refrigerator to be in vertical registry with the base plate 24. My illustrative connector plate 30 is pierced and formed to provide a turned-down tongue 34 having a vertically elongated perforation as indicated at 36. This tongue 34 extends against the inside surface of the web 20 so that the perforations 28, 36 are in registry. I then provide a stainless steel screw 38 which extends through the perforations 28, 36 and a nut 40 engaging the screw rigidly to fasten the upper end of the standard 16 to the ceiling to which the connector plate 30 is fastened. It will be appreciated that the function of the connector plate 30 is to hold the upper end of the standard 16 against transverse movement. The weight which is applied to the standard 16 is applied to the base plate 24 which is mounted upon the floor. The perforation 36 is elongated to provide for slight variations in the height of the ceiling.

The standards 16 are used in pairs with the flanges 22 of each pair of standards lying generally in common planes. This is best seen in FIGS. 3 and 4. Each flange 22 is provided with a plurality of vertically spaced apart, horizontally extending

notches 44 as best seen in FIG. 2. These notches 44 enter the facing edges of the aligned flanges 22 of a pair of standards 16. The notches 44 are provided in pairs in each flange 22 with each pair of notches, such as indicated at 44a in FIG. 2, being spaced apart and proportioned and designed to engage, respectively, upper and lower hook portions on an end of a guide member 42.

Referring now to FIG. 9, it will be seen that each guide member 42 is preferably an extrusion formed to provide an upwardly and longitudinally extending first flange portion 46 and a forwardly and longitudinally extending second flange portion 48. Each first flange portion 46 provides, at least at each of its ends and preferably throughout its length, a rearwardly and longitudinally extending third flange portion 50 and, at the rear edge of the third flange portion, an upwardly and longitudinally extending fourth flange portion 52, and, below the third flange portion, a rearwardly and longitudinally extending fifth flange portion 54 and, at the rear edge of the fifth flange portion, a downwardly and longitudinally extending sixth flange portion 56. These flange portions provide an upper hook portion 58 and a lower hook portion 60. The upper hook portion 58 engages the upper notch of a pair of notches 44 and the lower hook portion 60 engages the lower notch of the pair.

Referring now to FIGS. 10 and 11, the manner in which the end of a guide member 42 is connected to a flange 22 will be discussed. In FIG. 11, the guide member 42 is shown in its locked position on a flange 22 with a pan P supported on the outer, turned-up edge portion 72 of the first flange portion 48. It will be seen that the distance between the rearwardly facing surface of the first flange portion 46 and the forwardly facing surfaces of the fourth flange portion 52 and sixth flange portion 56 is equal to, or just slightly greater, on the order of a few thousandths of an inch, than the thickness of the flange 22 engaged by these surfaces. Thus, in order to disconnect the guide member 42 from the flange 22, it will be necessary to move the end of the guide member 42 vertically upwardly to the point where the lower edge of the flange portion 56 providing the hook portion 60 is above the lower edge of the notch 44a which is engaged by the lower hook portion. Then, as shown in FIG. 10, the guide member can be rocked about a longitudinally extending axis until the rearward edge of the third flange portion 50 and lower edge of the fourth flange portion 52 providing the upper hook portion 58 can be moved forwardly through the notch 44a in which the upper hook portion is engaged, this rocking movement being indicated by the arrow 70. It will be seen that, when the member 42 is rocked from its illustrated broken-line position to its illustrated solid-line position, the upper hook portion 58 can be removed from the notch 44a in which it is engaged.

It will be appreciated that it takes a positive action to disconnect an end of a member 42 from a flange 22, the positive action including a vertical lifting movement and then a rocking movement. Thus, the members 42 will not be accidentally disconnected from their supporting standards 16.

As stated previously, each standard 16 is a channel member providing a pair of vertically extending flanges 22, each of which is provided with notches 44. Thus, as clearly seen in FIG. 6, each standard can be used as a common standard for two stalls or cubicles of a rack system. That is, members 42 can be connected to one flange 22 of a standard 16 to have their second flange portions 48 extending outwardly in one direction and other members 42 can be connected to the other flange 22 of the standard to have their second flange portions 48 extending outwardly in the opposite direction. These second flange portions 48 provide runners on which the edges of pans, trays, shelves or the like are slidably mounted.

Referring to FIG. 5, it will be seen that I have shown a shelf member 78 mounted upon a pair of guide members 42, each of which is supported by a pair of standards 16. In the illustrative and preferred embodiment, this shelf member 78 is provided with downwardly turned flanges 80, 82 (FIG. 8) which extend perpendicularly to the guide members 42 on which the shelf member is mounted and which engage the ends of the guide members to prevent movement of the shelf member along the guide members. The shelf member 78 is also preferably provided with strengthening ridges 84 which extend in a direction parallel to the flanges 80, 82. I prefer that the shelf members 78 be constructed from resin bonded fiber glass sheets so that they will be strong, durable and easy to clean. The shelf members are made a part of my rack system to provide means for supporting pots, pans, frozen food packages, etc. which are not of such configuration that they can be slidably supported on the guide members 42. The ridges 84 reduce the frictional contact of the bottom of a pan or container with the shelf member 78 to make it easier to remove the pan or container from the shelf member.

Further, when the shelf members 78 are fabricated from fiber glass, they can be cut and trimmed easily during the installation of the rack system.

Referring to FIGS. 1, 3 and 4, it will be seen that standards 16 and guide members 42 can be arranged to provide a rack system to meet the demands of a particular restaurant or cafeteria kitchen. For instance, in the lower, left-hand portion of FIG. 1 and in FIG. 4, I show standards 16 and guide members 42 arranged slidably to support the long edges of a conventional bun pan which may be, conventionally, 18 inches by 26 inches, the spacing between the standards being indicated at 66, 68. In the lower, right-hand portion of FIG. 1 and in FIG. 3, I show standards 16 and guide members 42 arranged slidably to support the short edges of a rectangular pan, the spacing between these standards being indicated at 62, 64. The standards 16 will preferably be identical and the extrusions providing the guide members 42 will preferably be identical in cross section but cut to the desired length.

Since pans conventionally used in restaurants have standard depths, I have found that a spacing of 2 inches between each pair of notches, such as indicated at 44a in FIG. 2, is ideal. I prefer that the center-to-center distance between the notches 44 of a pair be 1⅛ inches. I further prefer that the horizontal width of the notches 44 be approximately seven-eighths inch. The guide members 42, of course, are dimensioned to mate with the pairs of notches 44.

It is the second flange portion 48 of each guide member 42 which provides a runner for slidably engaging the lateral edge or rim of a pan. Each guide member 42 extending between a pair of standards 16 will be parallel with, and at the same elevation as a corresponding guide member extending between a second pair of standards 16, such corresponding guide members being allochirally arranged so that their second flange portions 48 provide parallel runners for supporting opposite lateral edges of a pan. As best seen in FIGS. 9, 10 and 11, one type of guide member 42 which I may provide is proportioned and designed so that its second flange portion 48 is formed with a turned-up edge portion 72 providing a runner for engaging the downturned lip or rim of a pan P. This edge portion 72 is turned up preferably at an angle which is somewhere between 45° and 90°. In FIG. 11, the edge portion 72 is shown in solid lines at approximately 75° and in broken lines at approximately 90°.

In FIG. 13, I show another guide member 42′ proportioned and designed so that its second flange portion 48′ is formed with a turned-up edge portion 72′. This edge portion 72′ is turned up at an angle which is somewhere between 0° and 45°. The guide member 42′ may be used to support the lip of a pan P as illustrated in solid lines or the lateral edge of the bottom of a pan P as illustrated in broken lines. It will be appreciated that the guide member 42′ provides a degree of versatility in that it can be used slidably to support pans which are of different widths.

Further, in FIG. 12, I show a guide member 42″ which is formed to have a flat second flange portion 48″. This flat flange portion 48″ may be used to support the bottoms of larger pans P or the down-turned lips of slightly smaller pans.

While I have illustrated and described my rack system for use in kitchen environments, it will be appreciated that my

rack system concept may be used in any storage area and particularly where it is desired slidably to support items by their edges.

I claim:

1. A rack system for receiving and supporting items such as pans, shelves, and the like comprising at least two pairs of vertically extending standards, each standard including at least one vertically extending flange having a plurality of vertically spaced apart, horizontally extending notches provided therein, the flanges of each pair of standards lying generally in a common plane with the notches extending into the facing edges of the flanges and with corresponding notches in said flanges positioned at substantially the same elevation, a plurality of elongated guide members, each guide member extending between and connected to the flanges of one of said pairs of standards, each guide member providing an upwardly and longitudinally extending first flange portion and a forwardly and longitudinally extending second flange portion, each first flange portion providing, at each of its ends, an upper hook portion including a rearwardly and longitudinally extending third flange portion and, at the rear edge of said third flange portion, an upwardly and longitudinally extending fourth flange portion, and a lower hook portion including a rearwardly and longitudinally extending fifth flange portion and, at the rear edge of said fifth flange portion, a downwardly and longitudinally extending sixth flange portion, the upper and lower hook portions at each end of each guide member being engaged respectively in two of said notches in the flange of said standard to which the end of said guide member is connected, the upper and lower hook portion at each end of each guide member and the notches in which said hook portions are engaged being spaced apart and proportioned and designed so that said hook portions are disengaged from said notches by lifting the end of said guide member to elevate the lower edge of the sixth flange portion of said lower hook portion at that end above the lower edge of the notch in which said lower hook portion is engaged and then rocking said guide member about a longitudinally extending axis until the rearward edge of said third flange portion and the lower edge of said fourth flange portion of said upper hook portion can be moved forwardly through the notch in which the upper hook portion is engaged.

2. The system of claim 1 in which each standard is adapted, at its lower end, to be supported by and connected to a floor and, at its upper end, to be connected to a ceiling.

3. The system of claim 2 in which each standard includes a vertically extending channel member, at least one flange of which is provided with said notches, each channel member having a perforation in its upper end, and including a horizontally extending perforated base plate rigidly fastened to the lower end of each standard to provide means for connecting the standard to a floor, and a connector plate for fastening the upper end of each standard to a ceiling, each connector plate providing a downwardly extending tongue having a perforation arranged to register with the perforation in the standard to which the plate is fastened, and a fastener element extending through the registering perforations of each connector plate and the standard connected thereto.

4. The system of claim 1 in which said two pairs of vertically extending standards are arranged side by side so that each guide member extending between one pair of standards will be parallel with and at the same elevation as a corresponding guide member extending between the other pair of standards, such corresponding guide members being allochirally arranged so that their second flange portions provide parallel runners on which a tray, shelf, or the like can be mounted.

5. The system of claim 4 including a plurality of shelf members, each shelf member being mounted on and supported by the second flange portions of corresponding guide members, each shelf member being generally rectangular and provided with down-turned flanges extending along its edges which extend perpendicularly to the second flange portions on which the shelf member is mounted, said down-turned flanges of each shelf member engaging the opposite ends of the second flange portions on which the shelf member is mounted to prevent sliding movement of the shelf member.

6. The system of claim 5 in which said shelf members are formed from a sheet of resin bonded fiber glass and each shelf member is formed to provide spaced apart ridges extending across said shelf member and parallel to its said down-turned edges.

7. The system of claim 4 in which the second flange portion of each of said allochirally arranged corresponding guide members is provided with a turned up, longitudinally extending outer edge portion, said edge portions providing runners for engaging the sides of shelves, trays, pans and the like.

8. The system of claim 1 in which each of said standards includes a vertically extending channel member, the vertically extending flanges of which are provided with said notches, whereby said guide members can be connected to either flange of each standard so that each standard can be used to support guide members having second flange portions extending outwardly to one side and guide members having second flange portions extending outwardly to the opposite side.

9. The system of claim 1 in which each of said guide members is a section of an aluminum extrusion formed to provide said first, second, third, fourth, fifth and sixth flange portions.