Sept. 20, 1971 H. HARRISON 3,606,069

DETACHABLE TRAY UNIT

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Fig. 1

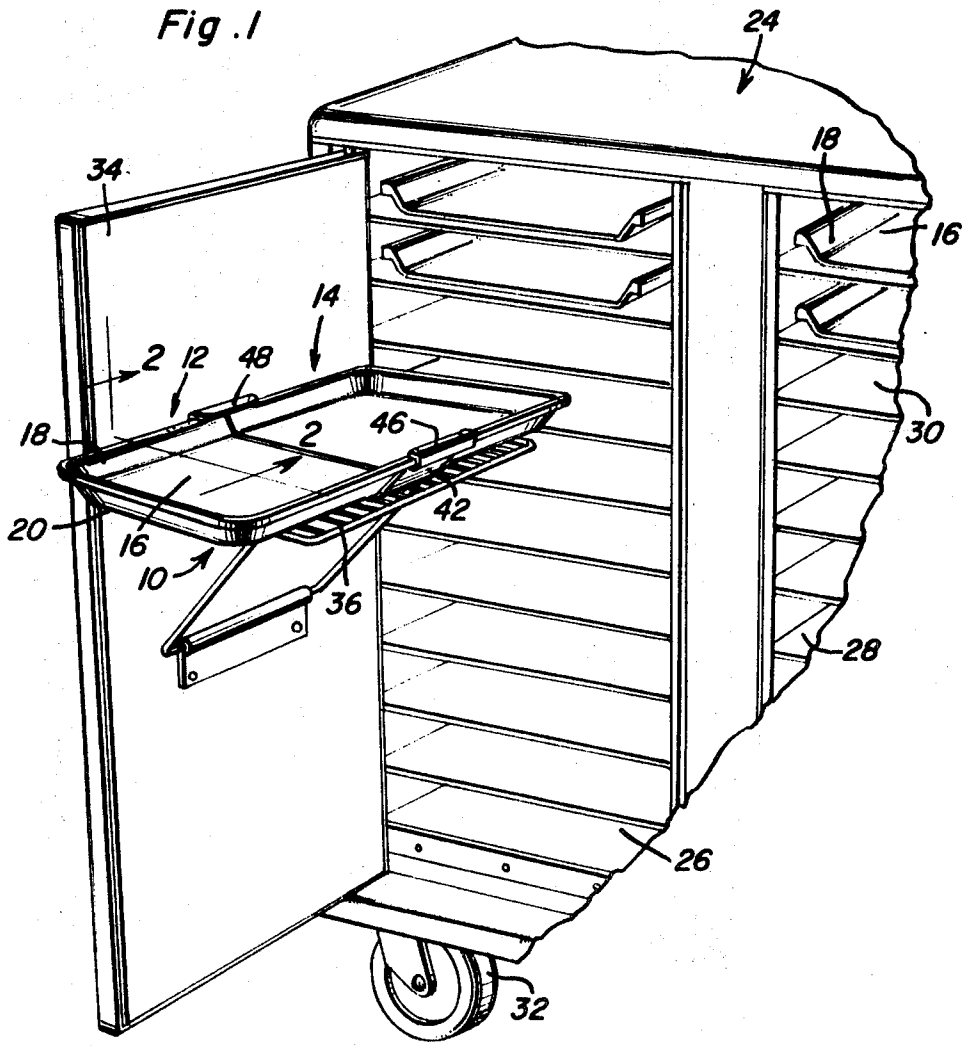
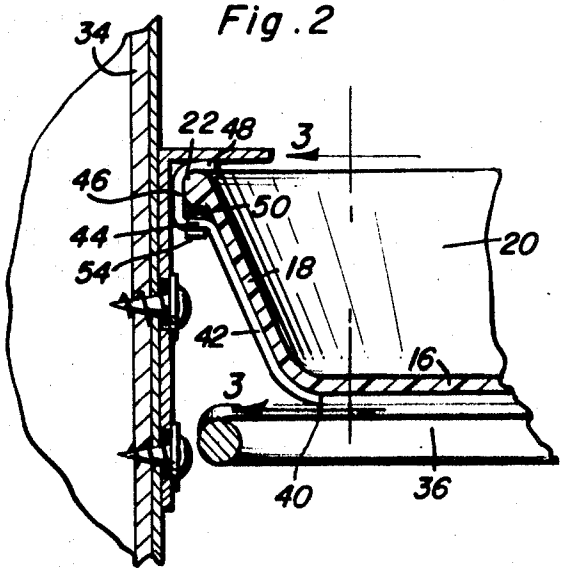


Fig. 2



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DETACHABLE TRAY UNIT

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Fig. 3

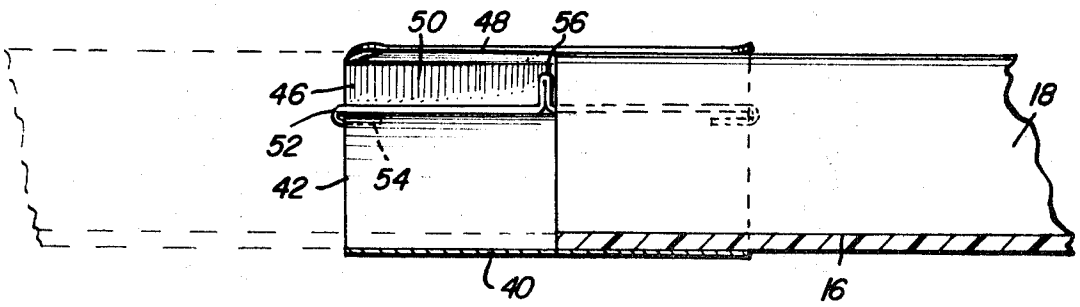


Fig. 4

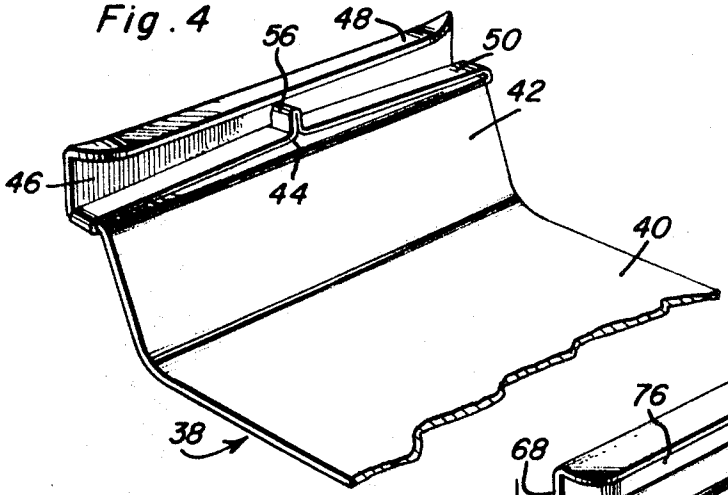


Fig. 5

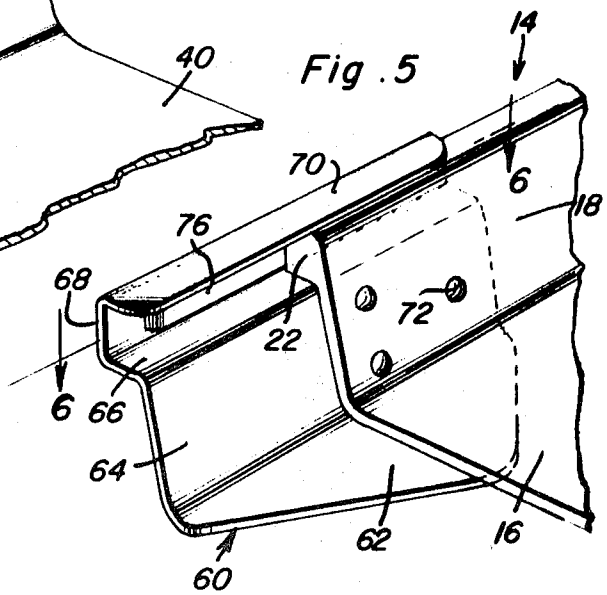
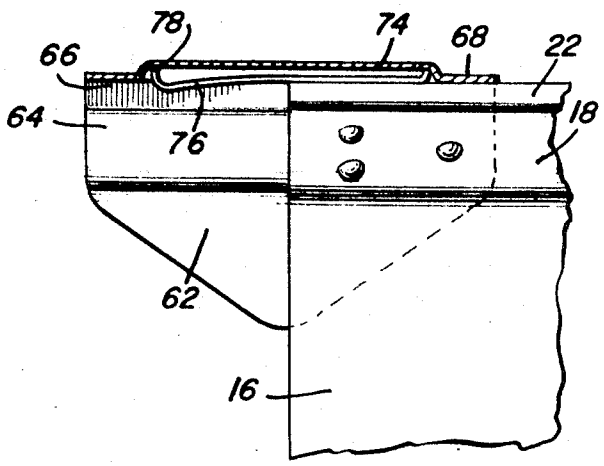


Fig. 6



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DETACHABLE TRAY UNIT

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Fig. 7

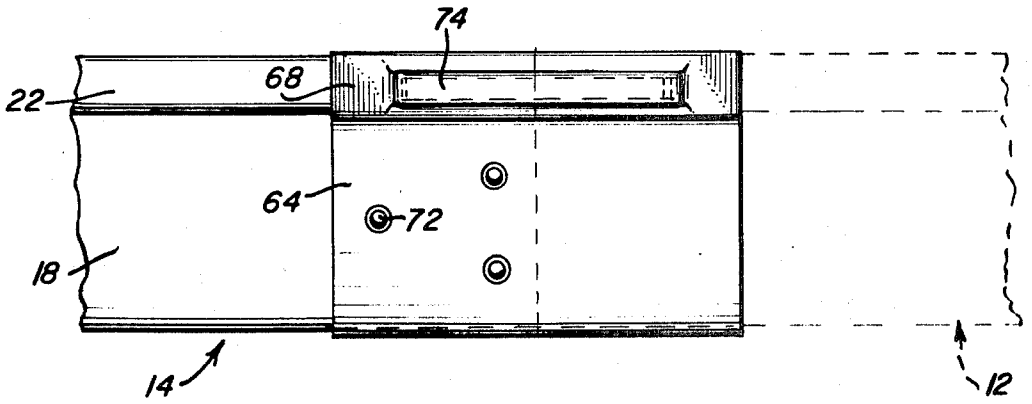


Fig. 8

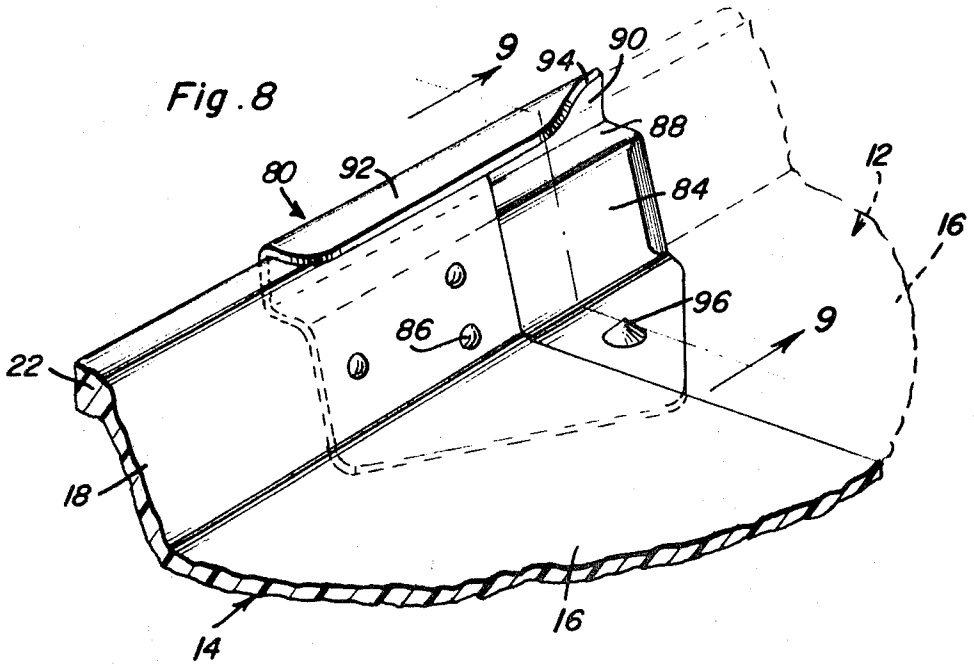
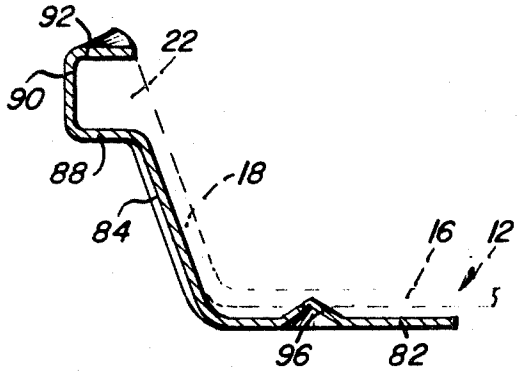


Fig. 9



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3,606,069

DETACHABLE TRAY UNIT

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Int. Cl. B65d 7/08, 7/32
U.S. Cl. 220—23.4 4 Claims

ABSTRACT OF THE DISCLOSURE

A tray unit incorporating two half tray units and structural devices for detachably interconnecting the units to form a complete carrying tray.

The present invention generally relates to tray units such as those employed in hospitals for serving meals to patients and more particularly a tray unit constructed from two detachably interconnected tray units which form a complete carrying tray when assembled.

As is well known, serving of foods at different temperatures to a consumer presents considerable problems especially in hospitals where a plurality of patients must be rapidly and quickly served. One conventional procedure presently employed is the provision of insulated carts having one compartment which is heated and another compartment retained in a cold or cooled condition. Each compartment includes a plurality of shelves each supporting a half tray with the half trays being loaded with appropriate foods in the kitchen and the cart then being conveyed to the floor of a hospital in which the meals are to be dispensed to the patients. A plurality of carrying trays are provided with the person serving the meals then placing on the carrying tray an appropriate half tray with food items thereon from the hot compartment and an appropriate half tray with food items thereon from the cold compartment with the carrying tray with the two half trays thereon then being carried to the conventional bed table of the patient and deposited thereon in the conventional manner. It will be appreciated that the carrying tray has no function whatsoever except for retaining the two half trays in assembled position thereon and the carrying trays must be picked up and cleaned in the same manner as the half tray units thus requiring the expenditure of considerable effort and time to retain the carrying trays in clean condition.

Accordingly, it is an object of the present invention to provide a detachable tray unit which basically includes two half tray units which are detachably interconnected to form a complete tray thereby completely eliminating the carrying tray for eliminating the initial cost of such carrying trays as well as eliminating the time and expense of cleaning the carrying trays and reducing the over-all weight of the tray assembly to be delivered to the patient by the person serving the meals.

The present invention has for one of its objects the provision of a connector securing two half tray units together into a single carrying tray which securely but frictionally detachably interconnects the mating adjacent edges of the half tray units.

Another object of the invention is to provide a connector in the form of a stainless steel connector member extending completely across the width of the tray and including flat leaf springs engaging the surfaces of the flanges formed on each edge of the tray units.

A further object of the present invention is to provide a connector including brackets that are attached to opposite flanges of one of the half tray units and frictionally engaging the flanges on an adjacent half tray unit.

Still a further object of the present invention is to

provide a detachable tray unit which is simple in construction, easy to use, secure and retaining the tray units assembled and easy to sanitize.

These together with other objects and advantages which will become subsequently apparent reside in the details of construction and operation as more fully hereinafter described and claimed, reference being had to the accompanying drawings forming a part hereof, wherein like numerals refer to like parts throughout, and in which:

FIG. 1 is a fragmental perspective view of a cart illustrating the manner in which the half tray units from the hot and cold compartments in the cart are assembled on a shelf provided on the door of the cart;

FIG. 2 is a vertical sectional view, on an enlarged scale, taken substantially upon a plane passing along section line 2—2 of FIG. 1 illustrating the structural details of the connector;

FIG. 3 is a detailed sectional view taken substantially upon a plane passing along section line 3—3 of FIG. 2 illustrating further structural details of the connector assembly;

FIG. 4 is a fragmental perspective view of the connector illustrating the flat leaf spring structure associated therewith;

FIG. 5 is a fragmental perspective view illustrating another embodiment of connector assembly including connector plates having one edge thereof connected to one of the tray units and detachably receiving the adjacent tray unit;

FIG. 6 is a detailed sectional view taken substantially upon a plane passing along section line 6—6 of FIG. 5 illustrating further structural details of this embodiment of the invention;

FIG. 7 is a side elevational view of the construction of FIGS. 5 and 6 observing the connector from the exterior thereof;

FIG. 8 is a fragmental perspective view illustrating another embodiment of the connector of the present invention; and

FIG. 9 is a detailed, sectional view taken substantially upon a plane passing along section line 9—9 of FIG. 8 illustrating further structural details of this embodiment of the invention.

Referring now specifically to FIGS. 1–4 of the drawings, the assembled tray unit in FIG. 1 is generally designated by the numeral 10 and includes two half tray units designated by numerals 12 and 14 respectively. The tray units 12 and 14 each includes a substantially flat bottom 16 and upwardly inclined side edges 18 and an upwardly inclined end edge 20 with the other end of the tray unit being open. The inner periphery of the inclined side walls 18 and the inclined end wall 20 is smooth but the outer surface thereof is provided with an enlarged flange area projecting laterally therefrom and designated by the numeral 22 thus defining a substantially laterally disposed horizontal and downwardly facing surface to facilitate grasping of the tray units 12 and 14.

The tray units 12 and 14 are supported in a mobile cart generally designated by the numeral 24 which has a hot compartment 26 and a cold compartment 28 each of which is provided with a plurality of shelves 30 slidably supporting the half tray units 12 and 14 respectively. The cart 24 is insulated and provided with the usual wheels 32 and a closure door 34 for each compartment. One or both of the closure doors 34 is provided with a collapsible wire shelf 36 for supporting the tray units 12 and 14 during assembly. The cart 24 is of conventional construction and the shelf 36 is also of conventional construction in that previouslly known arrangements employed the use of a carrying tray or mother tray receiving the two half trays therein. With the present invention, the carrying

tray or mother tray is completely eliminated and the two half tray units are interconnected by a connector generally designated by the numeral **38** and which includes a flat bottom plate or strap **40** which underlies the bottoms **16** of the half tray units **12** and **14** and bridges the juncture line therebetween.

At each end of the bottom plate or strap **40**, there is provided an upwardly and outwardly inclined wall **42** which terminates in an outwardly extending horizontal flange **44** that underlies the downwardly facing horizontal flange surface on the enlarged area **22** of the wall **18**. The outer edge of the horizontal flange **44** terminates in an upturned flange **46** which in turn terminates at its upper edge in an inturned flange **48** which is disposed in overlying spaced and substantially parallel relation to the flange **44** whereby the flanges **46**, **44** and **48** define an inwardly opening channel with it being pointed out that a similar construction is provided at both ends of the bottom plate or strap **40** and that this structure generally conforms with the external surface of the half tray units with the width of the connector **38** bridging the juncture therebetween as illustrated in FIGS. 1–4.

A flat leaf spring **50** overlies the flange **44** and the two outer ends thereof are reversely bent as at **52** with a small portion thereof underlying the flange **44** as indicated by numeral **54**. The center of the flat leaf spring **50** is upwardly bowed and is normally spaced away from the upper surface of the flange **44** but when the surface of the spring **50** comes into frictional contact with the undersurface of the enlarged edge **22** of the wall **18**, it will be forced downwardly against the surface **44** or adjacent thereto for frictionally locking the connector to the half tray unit. At the center of the flat leaf spring **50**, an upstanding U-shaped projection **56** is provided which delineates the two sides of the spring **50** and is located generally at the center of the connector so that the two half units will engage the center upstanding U-shaped projection **56** and thus limit it as to the degree of insertion into the connector.

As the half tray units **12** and **14** are removed from their respective compartments, the connector **38** will initially be connected to one of the tray units by telescopically engaging the open end edge of the tray with one end edge of the connector and telescoping the connector onto the tray unit until the end edge of the tray unit abuts the projections **56** thereon. The other half tray unit is than assembled with the connector and by exerting inward force on the outer ends of the two tray units, complete assembly of the half tray units **12** and **14** with the connector **38** will be assured. Due to the tight fitting relationship of the channels of the connector and the springs **50** which eliminate any looseness, wobbling or the like, the connector will effectively retain the half tray units in assembled condition so that they may be handled in substantially the same manner as a mother tray or carrying tray and the assembled tray unit will enable handling of the tray unit without danger of accidental disconnection thereof.

The tray units are constructed of conventional material such as fiber reinforced plastic material and the like while the connector is preferably constructed of stainless steel or the like thus enabling the connectors as well as the trays to be easily sanitized, sterilized or the like. To facilitate insertion of the tray units into the channels, the uppermost flange **48** may be slightly deformed upwardly at the outer ends thereof to provide somewhat of a funnel shapt to the end edges of the channels which combined with the rounded ends **52** of the springs will serve to facilitate guiding of the tray units into the channels at the opposite sides of the connector **38**. With the connectors removed, all of the tray units are of identical construction thus facilitating their handling, cleaning and the like and also facilitating the removal of the dishes therefrom and placement of food items thereon in the kitchen thus facilitating the entire feeding operation. The connectors are preferably constructed of stainless steel which will retain its structural characteristics even during long use and abuse and will also enable the connectors to be easily cleaned, sanitized, sterilized or the like.

The projection **56** will be relatively thin so that by slight canting of the tray units, the bottoms **16** thereof will be in abutting engagement to prevent the possibility of items becoming deposited between the adjacent edges of the tray units.

FIGS. 5–7 illustrate another embodiment of the invention in which the connector is generally designated by the numeral **60** and is in the form of a bracket oriented at each side of the tray units. In this construction, each of the connectors or brackets **60** includes a bottom plate or panel **62** underlying the bottom of the tray unit designated by the same reference numerals as in FIGS. 1–3. The outer edge of the bottom plate **62** is provided with an upwardly extending and outwardly inclined wall **64** terminating in an outwardly extending ledge or flange **66**. The outer edge of the flange **66** terminates in an upwardly extending flange **68** which terminates at its upper edge in an inwardly extending flange **70** whereby the flanges **66**, **68** and **70** cooperate to define an inwardly opening channel in substantially the same manner as the channel formed in the connector illustrated in FIGS. 1–4. In this construction, the bottom **62** partially underlies the bottom **16** of the tray unit and the inclined wall **64** engages the outer surface of the inclined wall **18** while the flanges **66**, **68** and **70** generally conform with and engage the enlarged flange **22** formed on the upper edge of the side wall **18**. Since the bottom **62** does not extend completely across the width of the tray, the bracket **60** is attached to one of the tray units such as the tray unit **14** by fasteners such as rivets or the like **72** which extend through the side wall **18** and the inclined wall **64** of the connector **60**.

As illustrated in FIG. 6, the vertical flange **68** is provided with a longitudinally elongated outwardly offset portion **74** receiving an elongated flat leaf spring **76** which has the outer ends thereof curved outwardly as at **78**. The outturned ends **78** of the spring **76** are received in the recess defined by the outwardly offset portion **74** of the flange **68** and is secured in place in the recess by virtue of substantially one-half of the spring **76** being received between the enlarged flange **22** on the wall **18** of the tray and the flange **68** as illustrated in FIG. 6.

In this construction, the connector **60** is preferably constructed of sheet metal such as stainless steel or the like and the rivets **72** are also preferably noncorrosive and nontoxic material such as sheet metal or the like while the tray units **12** and **14** are of the same conventional material. In this construction, the spring **76** is also constructed of stainless steel and when the second tray unit **12** is inserted into the open end of the channel defined by the flanges **66**, **68** and **70**, it will freely move into the channel until it engages the end of the spring **76** which will then securely and frictionally secure the detachable tray unit **12** to the tray unit **14** thus retaining the half tray units **12** and **14** in assembled condition for enabling the assembled tray units to be employed for serving food to a plurality of patients in a conventional manner.

Referring now to FIGS. 8 and 9 of the drawings, the numeral **80** generally designates another embodiment of the connector which includes a pair of brackets at opposite sides of a tray unit such as the tray unit **14** which is identical to the other tray units and includes a bottom **16**, an upwardly inclined side wall **18** and an enlarged flange **22** thereon. The connector **80** includes a bottom plate **82** underlying and conforming with the bottom **16** of the tray unit **14**, an upwardly inclined side wall **84** lying alongside of the external surface of the side wall **18** and secured thereto by rivets or other suitable fasteners **86**. The upper edge of the side wall **84** is provided with an outwardly extending flange **88** which underlies the enlarged flange **22** and the flange **88** terminates in an

upstanding vertical flange **90** which in turn terminates in an inwardly extending horizontal flange **92**. The flanges **88, 90** and **92** cooperate to define an inwardly facing channel along the top edge of the connector **80** with it being understood that a similar channel will be formed in the connector **80** at the opposite side of the tray unit **14**. The tray unit **12** is telescopically engaged with the connector **80** with the flange **22** thereof being received in the channel defined by the flanges **88, 90** and **92**. The edge of the flange **92** which receives the enlarged flange **22** on the tray **12** is beveled outwardly and deformed slightly upwardly as designated by the numeral **94** thus forming a guide for guiding the tray unit **12** into assembled relation to the connector **80**. Similarly, the free edge of the wall **84** may be slightly deformed outwardly to define a similar guiding action to facilitate assembly of the half tray units. To retain the half tray unit **12** assembled with the half tray unit **14**, the portion of the bottom panel or plate **82** which underlies the bottom **16** of the tray unit **12** is provided with an upwardly deformed detent **96** in the form of a conical member which will frictionally engage with the bottom surface of the tray unit **12** and retain the tray units **12** and **14** in assembled condition and at the same time bias the tray unit **12** so that the top edge of the flange **22** securely engages the top surface of the flange **92** thus serving not only to frictionally interlock the trays but also to retain the tray units rigidly in interconnected relation to prevent looseness and relative wobble therebetween thereby providing a secure tray unit capable of being handled by persons serving food items to patients or the like without danger of the tray units becoming separated.

When employing the present invention, the connector may be either a separate unit independent of either of the half trays being connected or it may be integral either with the hot half tray unit or the cold half tray unit. While various embodiments of the invention have been illustrated, each embodiment securely but detachably interconnects the half tray units in a secure manner that will retain the half tray units in interconnected relation in a substantially rigid condition thus eliminating tray wobble or looseness an assuring that the half tray units will be retained in assembled condition while being used.

The half tray units employed in this invention may be the same as those presently employed in combination with a mother tray or carrying tray with no modification whatsoever being necessary insofar as the half tray units are concerned except that the brackets which are fixedly attached to one of the tray units are secured thereto by any conventional fastening means such as the rivets illustrated. Further, use of the present invention is compatible with presently available insulated carts which are employed for carrying the pre-prepared meals from the kitchen to the floor of the hospital or other similar institution where the meals are to be delivered to the individual patients or consumers. In addition, the use of the present invention is compatible with present day cleaning equipment employed for cleaning the half tray units, thus enabling elimination of the large carrying tray or mother tray while retaining all of the advantages of employing the half tray units.

The foregoing is considered as illustrative only of the principles of the invention. Further, since numerous modifications and changes will readily occur to those skilled in the art, it is not desired to limit the invention to the exact construction and operation shown and described, and accordingly all suitable modifications and equivalents may be resorted to, falling within the scope of the invention.

What is claimed as new is as follows:

1. An assembly which includes a bracket means which connects the open end edges of a pair of aligned half tray units for forming a carrying tray almost exactly twice the length of the half trays wherein said bracket means is detachably engaged with one of said half tray units and fixedly attached to the other of said half tray units, said half tray units being completely separable and guided and retained in abutting assembled relation by the bracket means, said bracket means including a pair of independent brackets each having an inwardly facing channel-shaped member with spring detent means located therein along one edge thereof thereby telescopically receiving and securing a flange member on the detachably connected half tray unit.

2. An assembly for connecting the open end edges of a pair of aligned half tray units for forming a carrying tray comprising bracket means engaged with both of said half tray units, said bracket means including means detachably engaging at least one of the half tray units, said bracket means being fixedly attached to the other of said half tray units, said bracket means including a pair of independent brackets each having an inwardly facing channel-shaped member along one edge thereof telescopically receiving a flange on the detachably connected half tray unit, a flat leaf spring in each of said channels for frictionally engaging the flange on the detachably connected half tray unit.

3. An assembly which includes a bracket means which connects the open end edges of a pair of aligned half tray units for forming a carrying tray almost exactly twice the length of the half trays wherein said bracket means is detachably engaged with one of said half tray units, said half tray units being completely separable and guided and retained in abutting assembled relation by the bracket means, said bracket means being detachably connected to the other of the half tray units thereby enabling the half tray units to be interconnected by the bracket means, said bracket means including an elongated bottom panel extending in underlying engaging relation to the bottom surfaces of the tray units, upwardly extending flanges at each end of the bottom panel, the upper edge of each flange having an inwardly facing channel telescopically receiving flanges on the half tray units with one tray unit being telescoped into engagement with the channels from one end thereof and the other tray unit being telescoped into the channels from the opposite end thereof, and spring means in each of said channels for frictionally engaging the flanges on the half tray units for detachably securing the tray units in the channels.

4. The structure as defined in claim **3** wherein said spring means is in the form of an elongated flat leaf spring having an upwardly bowed central part disposed in the bottom of each channel, and an upstanding projection on the center of each spring for limiting the insertion of the half tray unit into the channels.

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U.S. Cl. X.R.

220—80